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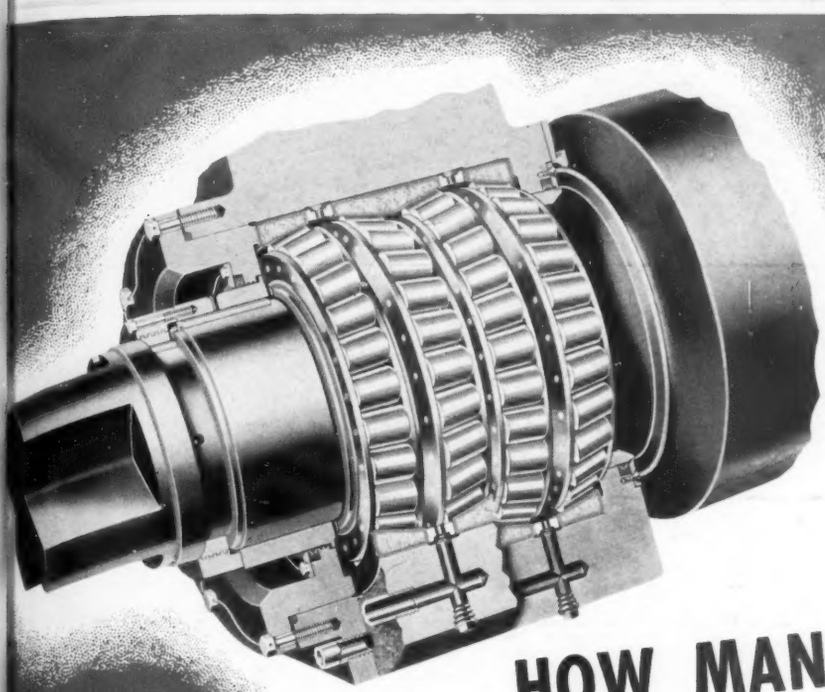
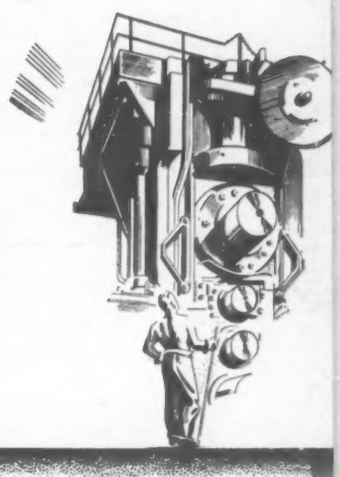
STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE
FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW





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Only The Timken Roller Bearing Company has the experience to answer that question—and even we cannot answer it with finality.

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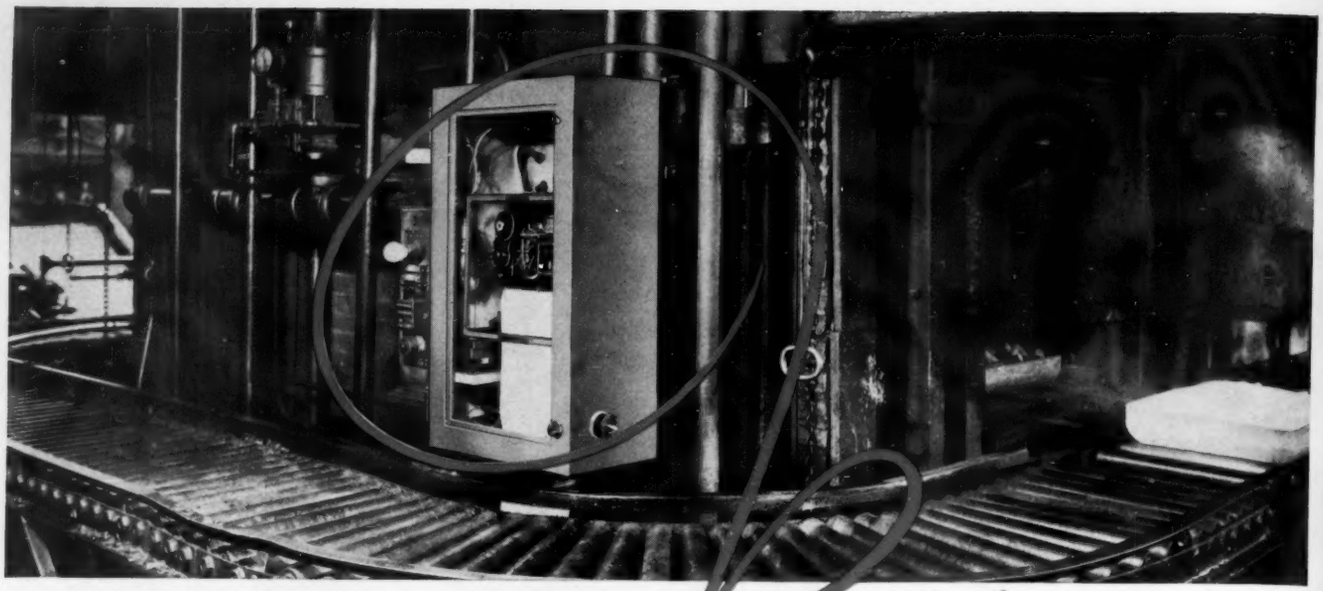
facturers of Timken Tapered Roller Bearings for automobiles, motor trucks, d cars and locomotives and all kinds of industrial machinery; Timken Alloy and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

TIMKEN
TAPERED ROLLER BEARINGS



MEET THE *Boss* . . .

of the heat-treating furnace

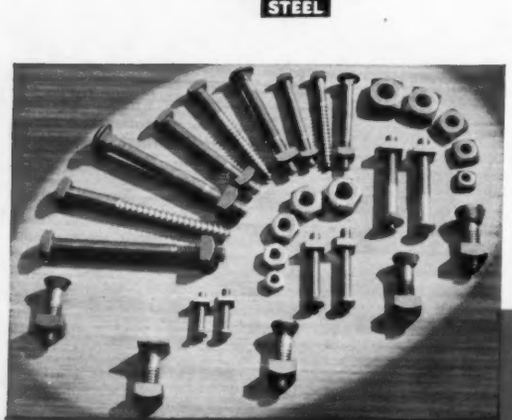
UPSON

REPUBLIC STEEL

His name is "Otto" (Automatic) Pyrometer. He isn't human in appearance—but he is better than any human being when it comes to keeping his heat-treating furnace at the proper temperature for correct grain structure and hardness of material as well as for relieving heading or forging stresses in Upson Quality bolts, nuts, rivets and other headed and threaded products.

Each heat-treating furnace in the bolt and nut plants of Republic has its own reliable "Otto"—and also the Republic metallurgists who check up on the "Otto's" by reading the lines they make on record charts.

Automatic pyrometers are but one of the many reasons why you always can depend on Upson Quality headed and threaded products—one of the not so little details that make perfection.



Bolts and nuts in all standard and special shapes, sizes, alloys and finishes. Standard and special rivets, automotive and railroad special items. Headed and threaded products for every use. Your specialties are our specialty.

BOLT AND NUT DIVISION

Republic Steel *Corporation*

GENERAL OFFICES . . . CLEVELAND, OHIO

When writing Republic Steel Corporation for further information, please address Department ST.

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Tax Destroys Reserves

To the Editor:

The experience of our company for 1937 in endeavoring to increase cash reserves and surplus and to expand working capital is probably characteristic of business in general.

Our cash reserves as of the end of 1937 were approximately four times what they were at the end of 1936 and our surplus increased nearly 100 per cent.

However, the matter of expanding working capital is a different story. Naturally in 1937 it was necessary to invest some additional amounts in inventory and new equipment, and we therefore find that, taking into consideration our federal tax liability, our current ratio taken from the current position at the end of 1937 was about 3.31 to 1 as compared with 3.08 to 1 at the end of 1936.

You will notice that I said, taking into consideration the federal tax liability. This is particularly significant because if we leave out the federal tax liability, the current ratio figures 12.8 to 1 as compared with 6.55 to 1 at the end of 1936. You can see from that why it has been necessary for us to accumulate such large cash reserves and why it is that they do us practically no good.

We distributed during the year what to us is a very good return to our stockholders, but it does not take us out of the 27 per cent bracket on the surplus tax, and it would be practically impossible for any company in this line or in similar lines to distribute an amount which would bring them down below the 22 per cent bracket.

If ours is a typical case, you can see that it is very difficult for a manufacturing organization in our line to accumulate in any one year sufficient additional working capital for it to very greatly alter its current ratio.

MIDWEST TOOL BUILDER

Cleveland.

More Yearbook Praise

EDITORS' NOTE—Letters in praise of STEEL's Yearbook continue to pour in. Excerpts from a few are given below:

To the Editor:

Kindly accept the compliments of the Streine Tool & Mfg. Co. on your 1938 Yearbook of Industry. It is truly a fine and comprehensive piece of work by an efficient organization.

FRENK W. DEINE

General Manager,
Streine Tool & Mfg. Co.,
New Bremen, O.

I have finally waded through your 1938 annual issue and wish to compliment you on a very splendid publication. You have taken a great mass of important information and good looking advertisements and put them together in a very readable, interesting manner.

KEITH J. EVANS

Advertising Manager,
Joseph T. Ryerson & Son Inc.,
Chicago

This is by far the most comprehensive, convenient and helpful annual you have yet published and you are to be congratulated.

C. B. COOK

Elwell-Parker Electric Co.,
Cleveland.

After carefully reading your 1938 "Yearbook of Industry" we sincerely believe this issue to be outstanding in all respects. We are looking forward to your continued progress in producing such a noteworthy publication.

M. D. MACPHERSON

Advertising Manager,
Alvey-Ferguson Co. Inc., Cincinnati.

The 1938 Yearbook is a very nice job. It shows considerable editorial effort and is a credit to your organization.

F. B. STUBINGER

Buffalo Forge Co., Buffalo.

After a brief comparison of the Jan. 3 issue of STEEL with the yearly issue of a similar magazine, I am of the opinion that the annual issue of STEEL is the best of any publication of its kind that has as yet come to my desk and you are to be congratulated most heartily.

EASTERN MACHINE BUILDER

No Antagonism to Labor

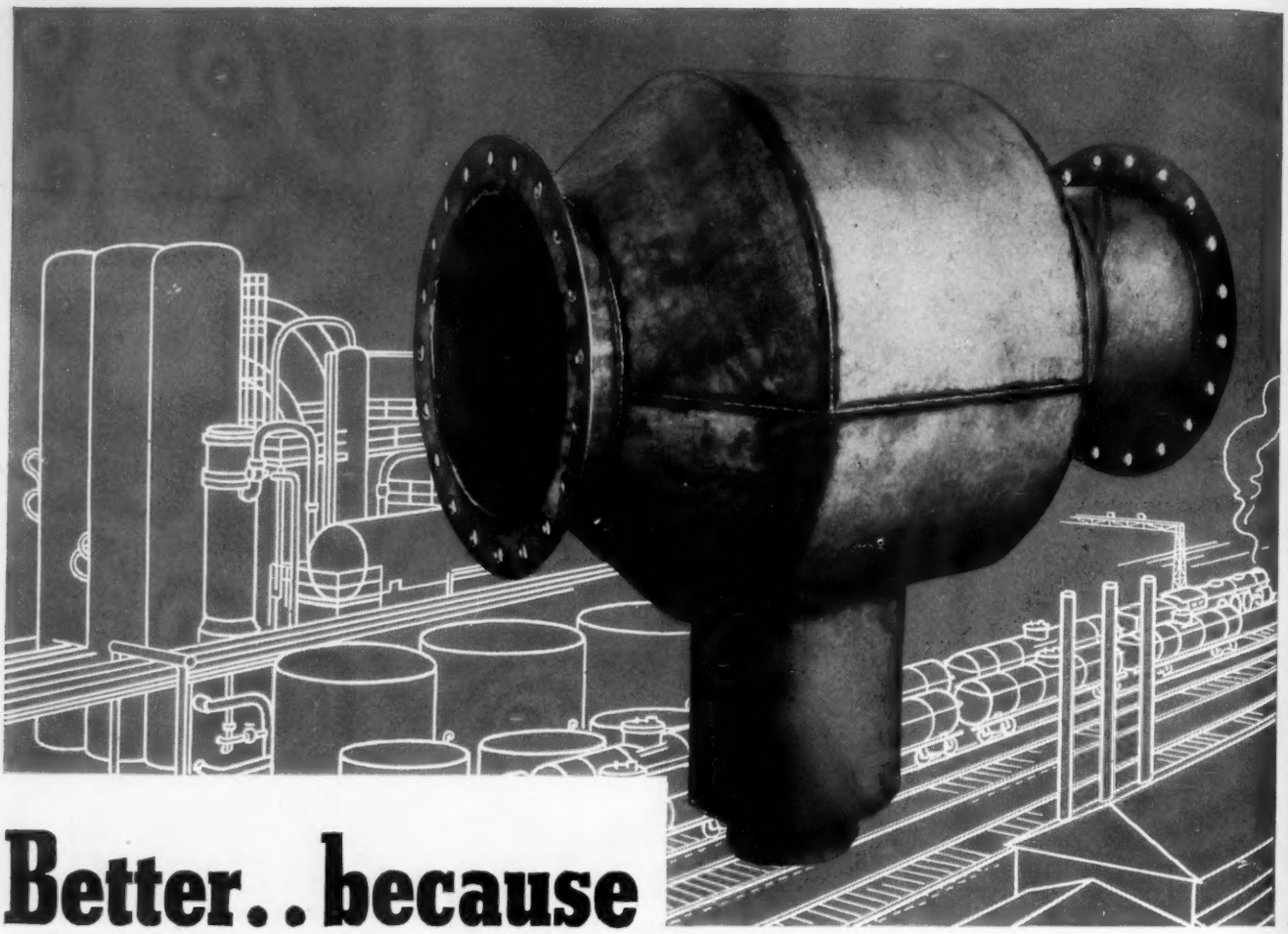
To the Editor:

I believe if one did not get any further in your magazine than the reading of Mr. Shaner's editorial comment he would at least have contributed to some sound thinking for the week.

The Steel Plate Fabricators association has just finished its annual meeting in Chicago. It was well attended and the informal table discussions were especially interesting in their exchange of ideas on taxes and labor.

It was certainly a matter of interest to see so many men gathered around the table, whose seeming desire was for betterment of labor conditions in their plants, a staple

(*Please turn to Page* 21)



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THIS all-welded separator for recovering nitric acid fumes is *better because it's chromium steel!* Eighteen per cent chromium in this steel gives it extra strength, toughness and corrosion resistance so that it resists the attack of nitric acid and other corrosive commercial chemicals even when concurrently exposed to high temperatures. Lower maintenance, longer equipment life and a better, purer product result.

In thousands of other corrosive processing applications, chromium steel does a better job and makes a better product. You should investigate the possibilities of chromium steel in your own plant.

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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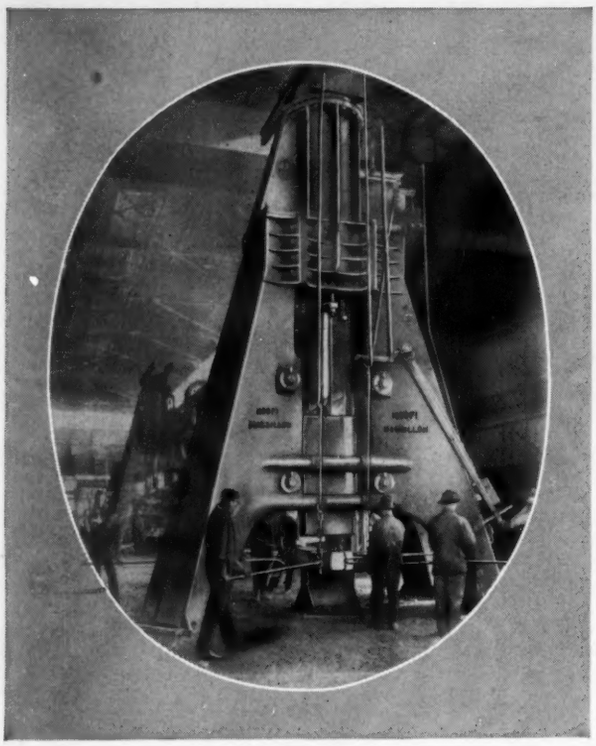
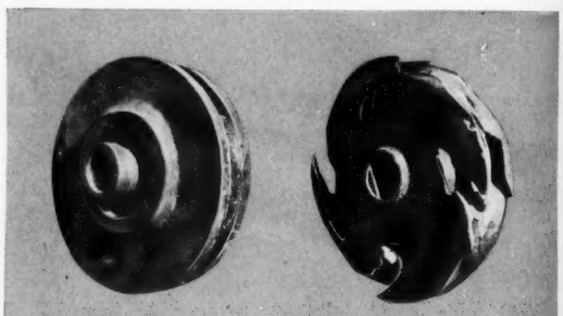
PROFITS *leak through many a loophole*

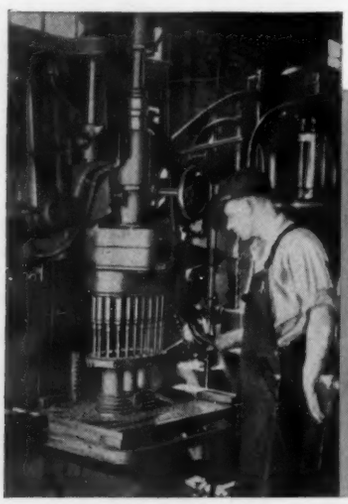
NICKEL CAN EASILY PLUG



MACHINERY repairs and replacements often run higher than you anticipate—often throw you for a *loss* when you are expecting to make a *gain*. Frequently, time lost when machines are out of action, may be far more costly than the expense of making the repairs themselves. But when equipment is fortified at vulnerable points with strong, tough alloys of Nickel, service records often stretch for astonishingly long periods. At left, a forging hammer illustrates the point. Located in a large Ohio Valley plant, it has bushings of Nickel alloy iron, produced by the Continental Roll and Steel Foundry Company. Because of wear in the bore it was recently decided to replace these bushings. When the records were looked up it was found that they had served for *ten years*. Bushings of the same composition had also served another hammer in the same plant for *twelve years*. Hence, when the new order was placed the same producer was asked to duplicate the original composition of Nickel cast iron. A record, demonstrating the need for keeping a record.

BEFORE and after — what happens to plain white cast iron impellers operating in pumps handling highly abrasive material consisting of 73% solid matter. Failure at the end of 551 hours was the average record of eight of these impellers. Yet, operating under identical service conditions, six NI-HARD* Nickel-chromium cast iron impellers demonstrated an average life of 1319 hours, a ratio of 2.39 to 1 in favor of NI-HARD. These results were obtained from records compiled at the Copper Cliff, Ontario, operations of The International Nickel Co., Inc.





UNDER the high-speed multiple drill pictured at the left is a compressor cylinder destined for use in refrigeration apparatus made by the York (Pa.) Ice Machinery Corporation. Among the requirements that must be met by a metal for this service are pressure-tightness, high wear-resistance and ease of machinability. All of these are supplied by Nickel cast iron, hence this is the material used by York for cylinders, top heads, pistons, crankcases and bearing heads. The company states that these parts in which Nickel is used *have never yet required replacing because of wear*. We invite consultation on the use of the alloys of Nickel in your equipment.

* NI-HARD — Reg. U. S. Pat. Off. by The International Nickel Co.— Canadian Patent No. 281,986.

NICKEL CAST IRONS

THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N. Y.

As the Editor Views the News

CONFERENCES of business men with the President last week cleared the air somewhat in regard to the relations between government and industry. The Chief Executive took pains to modify his sweeping remarks about holding companies, uttered the previous week. Also, it became clear that the recent and contemplated conferences are preliminary to another attempt to devise simple machinery (p. 33) for getting together representatives of industry, labor and government to consider questions of legislative and administrative policy. It looks like a cautious, tentative step toward reviving a few of the features of NRA.

• • •

Avoid Third Failure!

These conferences present excellent opportunities for improving government-industry relations. Already they have had a soothing effect upon public opinion, which had grown tired of vituperation. However, the representatives of industry, labor and government should not be too hasty in restoring machinery for dealing with problems of competition. We have tried this approach twice. In the twenties a voluntary attempt at fair practice agreements sponsored by Secretary of Commerce Hoover proved ineffective. In the depression an attempt supported by the police power of a federal law collapsed, even before the law was declared unconstitutional. Failure in the present and third attempt might easily lead to the nationalization of key industries.

• • •

Not Prince Or Pauper

That unity of purpose among all elements of the nation is essential to sound recovery is being emphasized in many current addresses of industrial leaders. Industry's position as an eager participant in the co-operative drive for business improvement was outlined with unusual clarity (p. 15) by Tom M. Girdler in an address to the alumni of Lehigh university. Concurrently Walter S. Tower, addressing the Manufacturers' Association of Beaver Valley (p. 15), presented information regarding the steel industry which explodes a number of popular fallacies in regard to profits, prices and wages. He deplored the common characterization of the steel industry as "prince or pauper." Instead, he declared, it should be characterized as a faithful servant of mankind, "whose fortunes ebb and flow, but which works unceasingly to aid in advancing the economic liberty and prosperity of all classes of people."

• • •

New Era for Diesels?

The recent formal opening of the new plant and laboratory of the Detroit diesel engine division of General Motors Corp. and the concurrent announcement of a plan for consolidating the corporation's diesel activities (p. 38) marks an important forward step in the development of the diesel engine manufacturing industry in the United States. For the first time plant facilities are available for building these power units on a mass production basis. The decision to concentrate the production of small diesels in Detroit, intermediate-sized units in Cleveland and the larger engines for railway use in LaGrange, as well as the plan for merchandising "packaged power" units, is of direct interest to scores of companies which supply materials, parts and accessories for diesels.

• • •

Warehouse Quotations

Addition of 0.1 per cent or less of tellurium to lead gives the metal properties which make it advantageous for use in pickling and plating equipment. The presence of the small amount of tellurium in lead (p. 45) results in a fine, uniform grain size and an unusually high resistance to corrosion by sulphuric and other acids, even at high temperatures and where vibration is present. . . . Comparison of the practice employed in annealing hot-rolled strip steel in two plants (p. 56) shows several variations in methods of firing, in temperatures and in other details of the annealing cycle. A similar article on the annealing of cold-rolled strip will be published in an early issue. . . . STEEL presents in this issue (p. 75) a revised and greatly improved table of steel warehouse prices. Base prices for 18 products reported from 21 warehouse centers are quoted.

E. L. Shaner

New Aid for Steel Users

● The increased production speeds and improved manufacturing standards of the last few years have emphasized the need for greater uniformity and higher quality in steels.

Ryerson began work on this problem several years ago. By tightening specifications and making inspections more rigid, we gradually built up stocks of these better steels. Today we are in a position to definitely and unequivocally certify to the known high quality and uniformity of all steel in stock.

In addition, a special plan was developed for the alloy steels involving a degree of control never before attempted by any steel service company. Whole heats of alloy steel that measure up to special Ryerson standards are selected. They are accurately identified and thoroughly tested. Special Data Sheets showing chemical and physical properties, actual heat treatment response, etc., are prepared. This data is sent with every shipment of alloy steel. The heat treater thus knows exactly what is in every bar and how to secure the best possible results.

Let us send you a copy of the new Ryerson Certified Steel Book (M 2) which explains in detail how this new plan will save time and money. Address the nearest Ryerson plant.

RYERSON *Certified* **STEELS**

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

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Steel's Answer to Critics Presented

By Girdler and Tower

■ CRITICS of the steel industry—in Washington, and elsewhere — received their answer last week, in two moderately phrased but penetrating statements by the industry's spokesmen, T. M. Girdler, president, American Iron and Steel institute, and chairman, Republic Steel Corp.; and Walter S. Tower, executive secretary of the institute.

Not in a spirit of recrimination did they speak, but to point out some of the absurdities of the charges which have been made, to explain the difficulties which steel makers are facing and to emphasize that the industry is ready to cooperate with the government, if the government's plans can be clarified.

Both told why great aggregations of capital are necessary, how ownership actually is in the hands of many thousands of persons; why the industry cannot create employment —"manufacture for stock"—when demand is sliding off; why profits are low.

Co-operation Is Keynote

Mr. Tower's speech was delivered before members of the Manufacturers' Association of Beaver County, Beaver Falls, Pa.; Mr. Girdler's at the Lehigh university's alumni banquet, Murray Hill hotel, New York.

Mr. Tower's remarks were a little more analytical of conditions within the industry, while Mr. Girdler's considered the government's position. Keynote of the latter's was co-operation. "Looking to the months and years ahead," he said, "I believe industry is ready for the greatest development and expansion that the human race has ever known."

"Over the years, larger and more efficient producing units, including blast furnaces, open hearths and finishing mills, have all marked the progress of increasing mechanization," said Mr. Tower.

"Through all such advances in perfecting the art of producing steel, the application of mechanical power and mechanical devices has been fundamental. But in spite of it all, the record of employment in the steel industry shows no permanent displacement of workers. The figure of more than 600,000 on the payrolls in August of 1937 represents an increase of more than 30 per cent above the number employed in 1929, which still stands as the greatest year in steel production. Since that year, the reduction in the average length of the work week has been about 26 per cent, but the increase in number of men has been greater than would be required to offset the reduction in hours worked.

"So far as technological advance in the steel industry is concerned, the effect appears to have been primarily to improve conditions surrounding the tasks which steel workers perform, and to increase their earning power.

"The notion that the steel industry arbitrarily restricts production, as part of a deliberate policy, is false, and is, in effect, a confession of ignorance of the conditions under which steel must be made.

Steel Made to Order

"Steel, from its very nature, must be made to satisfy definite demands. But the idea of continuing to make steel when demand falls off is based on the unsound assumption that producing steel for stock is simple.

"In an industry where a standard article is made to one specification in a process of endless repetition, production for stock may be sound practice within the limits which experience dictates. In an industry like steel, however, where hundreds of products are made in scores or hundreds of varied combinations of shape, size, and chemical analysis, the problem of making for stock on any large scale presents difficulties which are insurmountable.

"An examination of the financial statements of more than a score of prominent companies in the industry at the end of 1936 showed a total of less than $300,000,000 in cash and marketable securities. That amount of cash or equivalent is not too large for such companies in an industry where the value of output last year probably ran above

"Neither Prince nor Pauper but Servant"

Walter S. Tower

■ "You are all familiar with the common characterization of the steel industry as either 'prince or pauper.' It seems to me to be a most inappropriate characterization.

"The steel industry has never been in the condition of a pauper, depending on the bounty of those who pity its plight. It has never been a prince in the sense of rolling in fat revenues and attempting to exert its influence over its fellows.

"The steel industry may better be characterized as a servant of mankind, a faithful servant whose fortunes may ebb and flow, but which works unceasingly to aid in advancing the economic liberty and prosperity of all classes of people. It is a servant which puts into the hands of man the most useful material now known."—WALTER S. TOWER

two and a half billion dollars. It probably represents less than two months' billings at the rate of operations in 1936. It could be depleted to a dangerous extent by continuing, for only a relatively short time, to produce steel for which immediate outlet is not in sight.

"There has recently been much discussion of the important stimulus to industry which might come from an active program for building private dwellings in the low-priced field. No one would be rash enough to minimize the importance of large scale housing construction as an aid in stimulating industrial activity. But the direct connection with steel consumption can be much over-emphasized.

"Reliable estimates of materials required in constructing dwellings designed to sell at about $4000, indicate the use per dwelling of less than two tons of steel products. The most active building boom of recent times in this country, I believe. has not included as many as 500,000 private dwellings in any one year. Assume, however, that such a yearly number might presently be included in a building program and that each one of the half million required as much as two tons of steel products as building material, the entire direct demand would represent barely one week's output for the steel industry.

"A third point on which I want to touch is the question of profits and prices in the steel industry, because of the common statement or implication that the industry defeats its own ends or works to the disadvantage of the general economic good by following a commercial policy in which excessive profits are the dominant influence.

Profits Not High

"Profits in the steel industry have not been high; they have been notoriously low. On the aggregate investment in the industry, the average return over the last ten years has been barely 3 per cent, and the industry has not averaged as much as 5 per cent over any protracted period for which there are reliable records.

"Last year, in which production was the third best in the experience of the industry, net earnings probably did not reach $225,000,000, or less than 6 per cent on the capital investment.

"In terms of tons of products made for sale, such estimated earnings for last year almost certainly did not average $7 per ton. That represents less than one-third of a cent per pound, or about what the corner grocer makes on a pound of sugar or flour.

"It is sometimes argued by critics outside the industry that when demand wavers prices should be promptly reduced in order to stimulate greater volume, and that increased volume would compensate for the lower price. Such an argument is based on the theory that demand is always elastic in its response to price. That theory may hold in the case of many classes of consumers' goods like food and clothing. The theory, however, does not appear, on the basis of experience or statistical record, to hold equally true in the case of a producers' goods like iron and steel.

"The cost of steel is only a minor factor in the total costs of most of the articles into which it enters. For that reason fluctuations in the price of steel, within the limits set by rigidities in the cost of production, are not a controlling influence on demand for such articles. And the theory also quite overlooks the very natural tendency among industrial buyers to withhold purchases of materials, wherever feasible, when prices are on the decline.

"The fact seems to be that the steel industry maintains itself on a scantily profitable basis by a narrow margin, which is accomplished only by striving for every efficiency which can be realized. It is an industry in which any economy is at a premium. Savings in cost, reckoned in cents per ton, have been accomplished more than once only through the expenditure of millions of dollars for more efficient facilities.

"New investments are always being demanded by the persistent striving for a better quality, which may be furnished to consumers at the same, or at a less, price than they have paid before. Through those efforts and accomplishments, the steel industry, by betterment of its product, has been a prime force in promoting general industrial activity and progress in this country."

Mr. Jones Speaks Up

■ Asking co-operation between employes and management, and elimination of waste in business, Percy C. Jones, president, S. M. Jones Co., Toledo, O., manufacturer of oil well sucker rods, emphatically added:

"It is hard enough for an old fellow like me to bat around the country in airplanes and sleeping cars selling sucker rods, without being bedeviled and pestered, harassed and treated like a convict by the government—and I am getting tired of it."

Girdler's Talk Conciliatory; Sees Government, Industry Co-operating

■ "I BELIEVE that just as the country has solved its great problems of the past so we will find a way to overcome the grave difficulties of depression and increased unemployment now confronting us," said Mr. Girdler.

"In searching for a way out of our present plight the time has come for open-minded co-operation among all forces having the welfare of the nation at heart.

"Solution of the problem should not be difficult. There is no great gulf between the objectives of industry and the objectives of the government. Fundamentally both want to see that work is provided for every one who wants to work.

"Government spokesmen say they want to abolish poverty and increase the purchasing power of the masses of the people. Industry wants the same thing. Industry is absolutely dependent for its life in this country upon the mass consumption of goods. Accordingly I say there is every material and humane reason why the government and industry should co-operate in stemming the recession, in bringing back prosperity and in spreading it widely.

"In our complex modern civilization industry recognizes the necessity for fair and impartial government regulations and rules to prevent abuses and practices which are not in the public interest. It is just as necessary to restrain the chiseling minority in business as it is to restrain the law breakers among our citizens. But business does not approve the imposition of controls based on false theories. It is a generally accepted fact that the great majority of business men are honest. Isn't it possible that a way can be found to give clearance to this honest majority and permit the march of recovery to move ahead?

"I think business is far less disturbed over reasonable government regulations than it is over the apparent lack of a definite plan or program of government relations toward business. Business and industry are able and willing to adapt themselves to any fair and sound program. They only want to know what that program is to be over a reasonable period of time.

"One result of this situation (uncertainty) has been to frighten and to send into hiding the average investor upon whom industry depends for a large part of its development

and expansion. . . . At the end of the last fiscal year, on June 30, 1937, there was in round figures $60,000,000,000 in deposits in the nation's banks. This total was within a few million dollars of an all-time record. This vast sum represents the property of many millions of citizens and it typifies the real ownership of wealth in the United States.

"Occasionally we hear voices raised in an attempt to convince the people that their interest and that of industry lie in opposite directions. The very extent of the diffusion of ownership of the wealth of this country, in the hands of millions of savers and investors, disproves that statement. The steel industry, for example, is owned by half a million stockholders, a majority of whom hold less than 20 shares each."

Mr. Girdler then emphasized the necessity for great industrial units in this country, the need for large capital investments in basic enterprises such as steel. "It takes at least $11,500, invested by some one, to make a job for a steelworker," he said.

"What I have said about bigness in business is not meant to detract in any way from the importance and necessity of the thousands of small enterprises in the country. There always has been and always will be the need for small businesses to do their particular jobs. Often it is true that the small business of today is the big business of tomorrow.

"After all, the same basic principles govern all business, whether large or small. Both have been affected by the new developments and new government policies of recent years which have introduced elements of rigidity into the overhead cost of business.

"What is the future of industry in America? I believe that the difficulties of the moment are less acute than those which were conquered four years ago. I believe it lies within the power of industry and the government working in harmony to demonstrate that the worst of the decline has been passed and that we presently will be on the path of improvement. How far and how rapidly we will proceed on this road will depend upon the success of efforts to restore confidence and eliminate the causes of some of the fears which have gripped the country.

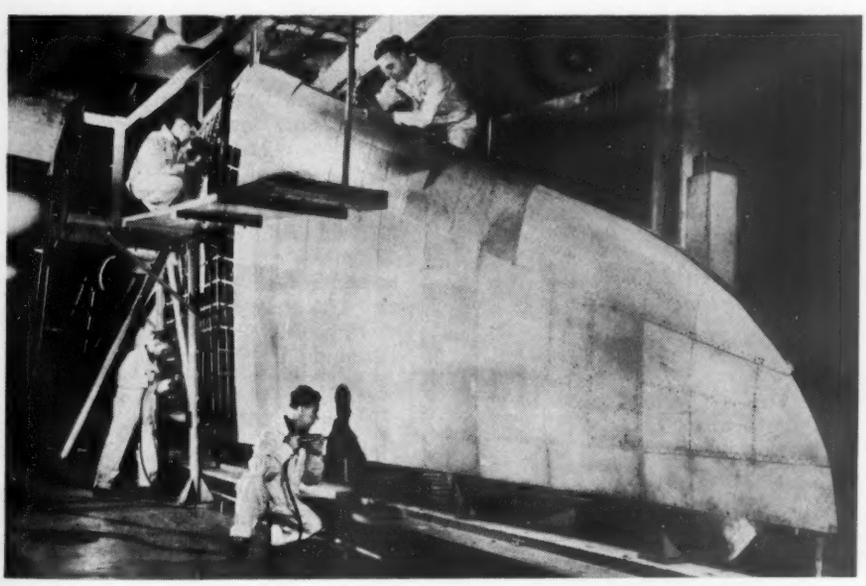
Industry Fights for Recovery

"Meanwhile responsible executives and worthwhile salesmen in companies throughout the country are fighting in the front-line trenches to get orders and to speed up the wheels of industry. These men are taking fresh hope from the apparent intention of the government and industrial leaders to aid them in going forward.

"Looking to the months and years ahead I believe industry is ready for the greatest development and expansion that the human race has yet known. As great a part as steel plays in civilization today, it is as nothing compared with the promise of the future.

"The achievements of private enterprise in this country give ample proof that our capitalistic system of free and independent business, based upon the social need for a high standard of living for our people, is the best system that man has yet devised."

"Tail Feathers" for Transoceanic Clipper



■ **New slant on the massiveness of the Pan American Airways transoceanic clippers is offered by this view of a horizontal stabilizer, measuring 49 feet from tip to tip. With elevators added it will have an area greater than total wing spread on many twin-engined transport planes. Terminal fittings are heat-treated steel. Covering for the horizontal stabilizer is 24ST Alclad aluminum alloy, inside members of tail structure are 24ST aluminum alloy and smaller tubing is 17ST aluminum alloy. Six of the 72-passenger, 4-engined, 41-ton flying boats are being produced by Boeing Aircraft Co., Seattle**

Conferences Clearing Air, Says President

■ Conferences with industrial leaders are clearing the atmosphere and tending to dispel false impressions, said President Roosevelt at his press conference last Friday. He indicated he has no immediate plan for any new co-ordinating unit between government and business.

Conferences with small business men will be held this week, he said.

Invite 1700 To Apply For Jobs at Irvin Works

■ Seventeen hundred workers normally employed in the National works of Carnegie-Illinois Steel Corp., Monessen, Pa., which is now shut down, were invited to apply for jobs in the new Irvin works, near Clairton. E. P. Aldredge, general superintendent, said arrangements had been made to interview all applicants Jan. 24 at the plant.

At least one unit of the Irvin works will be opened in April or May, according to corporation officials.

New Treaty with Canada May Aid Steel Exporters

■ A determined effort to obtain additional advantages for American steel exporters will be made by the state department when it negotiates the new trade agreement with Canada, according to reports from Washington.

Under the original trade agreement with Canada, American steel exporters did not receive any appreciable advantage for their products.

Fairless Excused by Senate Committee

■ B. F. Fairless, president, United States Steel Corp., was excused from appearing before the special senate committee on unemployment last Saturday because of illness. Senator Byrnes said Mr. Fairless' prepared statement would be incorporated in the record.

Face Feb. 7 CIO Parleys Under Changed Conditions

Steel—When CIO Pacts Were Signed—and Now

	Feb., 1937	Jan. 22, 1938
Steel Prices (finished steel composite)	$55.80	$61.70
Steel Works Operations	81.9	30.5
Steel Payrolls	$74,278,000	*$62,119,000
Average Hourly Earnings	72.8 cents	* 82.1 cents
Average Hours Worked Per Week	42.4	* 27.6
Average Monthly Output Per Employe	15,877 lbs.	* 7818 lbs.

*Figures are for November, 1937, latest month for which official statistics are available.

■ JUST two weeks away is the scheduled meeting between representatives of the United States Steel Corp. and the Steel Workers Organizing committee to negotiate a new contract on wages, hours and working conditions for a period beginning March 1.

The present contract, the first ever signed by the Steel corporation with an outside union, provides for a joint conference in Pittsburgh Feb. 7.

Vastly different is the steel industry's situation now as compared with last spring when the present agreement was signed.

Then steel was riding the crest of the business revival. Operations were near 90 per cent. Demand was heavy, books clogged with orders for several months. Employment was increasing and steelworkers were averaging more than 40 hours a week. Steelmakers were anxious to avoid interruption.

Now steel is in a serious recession. Operations hover around 30 per cent. Demand is light. Producers are under pressure from the national administration and consumers for price reductions.

Also reversed is the position of organized labor. A year ago, John L. Lewis' Committee for Industrial Organization was gaining strength. Labor was in great demand. Prospects for increased wages were bright. It was fairly easy to sign up new members by promising higher wages.

Now, wage rates are maintained, but earnings have shrunk as hours have been shortened. Union members have lost much of their enthusiasm for paying dues.

That Lewis and SWOC Chairman Philip Murray realize their position was evident last week. To sustain some hold on the rank and file, SWOC leaders held "pep" meetings, with Murray assuring contracts will be renewed and new ones signed. From Washington, Lewis boomed opposition to wage reductions.

Preliminary conferences between Lewis and Myron C. Taylor, chairman of the Steel corporation, already have started; but from these has come no indication of the final outcome.

Interest in the negotiations is heightened because similar conferences with other steel and metalworking companies having SWOC agreements will follow.

As regards relations with the CIO, steel and metalworking companies fall into five categories: Companies which voluntarily signed agreements for collective bargaining for the union's membership; companies that signed exclusive bargaining contracts following national labor relations board elections in which the CIO won; companies which resisted unionization and definitely broke CIO strikes; companies which filed a statement of labor policy with a disinterested party, but did not recognize the union; companies which have not been confronted with the issue.

Most companies in the first group signed agreements similar to that signed by Carnegie-Illinois Steel Corp. and which became almost the standard CIO contract. Its principal provisions:

WAGES—based on a $5 minimum for an 8-hour day. This was an increase of 10 cents an hour over the former rate for unskilled labor. Equivalent increases were granted skilled, piece and tonnage workers.

HOURS—standard 40-hour week of five 8-hour days adopted. Time and one-half provided for overtime.

VACATIONS—one week with pay granted to employes with five years' service.

ADJUSTMENT OF GRIEVANCES without suspension of work was essayed by providing for a grievance committee of employes, and various stages of conferences and arbitration.

Blackest mark on the union's recent record in relations with steel companies was last week's strike at the Harrison, N. J., plant of Crucible Steel Co. of America. Called after an outside union organizer had been denied a place on a grievance committee, the strike soon was settled. Company officials pointed out its contract with the union expressly provided only employes were to be members of the grievance committee, reaffirmed their intention of conforming to the agreement, demanded the union do likewise.

Steel Supports Roof Lake

■ **Alternating-current arc welding was used to fuse all of the steel frame work in the Westinghouse Electric & Mfg. Co.'s new office building in Sharon, Pa. Atop the glass and steel structure will be a 10,000-square foot "lake", 2 inches deep, to supplement air conditioning equipment used to cool the upper floors**

■ Fair trade laws, now operative in 42 states, are analyzed in a bulletin issued recently by American Supply and Machinery Manufacturers' association Inc., 1108 Clark building, Pittsburgh.

Cut in Federal Road Funds Protested at Road Show

■ STEEL and related metal producing and fabricating industries could point with pride to the 1938 road show held in Cleveland last week in connection with the thirty-fifth annual convention of the American Road Builders' association, for the various lines of road building equipment exhibited demonstrated that manufacturers have lost no time in adapting modern materials and methods to their exacting requirements.

The exhibits of 225 manufacturers, ranging from light-weight, hand-operated machinery to heavy-duty, massive, power-driven equipment used in road building operations, taxed the capacity of Cleveland's spacious Public Auditorium and its adjoining exhibition halls.

With an attendance in the neighborhood of 27,000 the show and convention was regarded as one of the most successful which the association has held. It is expected that the organization will return to Cleveland for its 1940 meeting and show.

Purchases Total $4,000,000

As the show closed, it was announced by Charles M. Upham, engineer-director, American Road Builders' association, that purchases of road building machinery by contractors totaled nearly $4,000,000 during the week.

Dominant in convention sessions was the outspoken and sharp criticism of President Roosevelt's proposed reduction in federal highway funds. "Shrewd politics, perhaps, but dubious economy," was the label placed on the presidential recommendation by Col. Willard T. Chevalier, vice president, McGraw-Hill Publishing Co., New York, and president of the association, in his address opening the convention.

Col. Chevalier emphasized that the highway industry affected the economic status of one out of every seven persons gainfully employed in the country. He pleaded for extension of the program of road improvement, rather than a reduction.

Stating that the President has mentioned a desire to go back to the figure of a five-year period preceding the depression, the speaker declared that we now have seven million more automobiles on our roads than during that period. Competent authorities predict that in the next four years the highways must accommodate an additional four million cars.

Tax Money Diverted

Murray D. Van Wagoner, state highway commissioner of Michigan, and president-elect of the association, also attacked the President's proposal. "Since the origin of the national highway act in 1916, the federal government has collected $2,033,022,000 from motorists of the United States," he said. "In the same period, the motorists have received back $1,987,655,000 in highway benefits. In other words, American motorists since 1916 have paid $46,000,000 more into the federal treasury than they have received in highway improvements."

The association passed a formal resolution protesting this diversion.

The committee on elevated highways advocated the construction of elevated highways as a solution to traffic congestion and pointed out that such construction is less costly than street widening and tunneling. Reporting as chairman of this committee, V. G. Iden, secretary, American Institute of Steel Construction, New York, pointed out that only about 3300 miles of roads in the United States are paved four lanes wide or wider. Such improvements are concentrated around congested centers, but the urge to widen the highways within city limits themselves has been restrained owing to cost of the work.

"Some 40,000 persons were killed in 1937 on the highways of the United States," Mr. Iden reported. "More than 125,000 persons were permanently disabled and almost 1,500,000 suffered lesser injuries in traffic accidents. It represents an increase of at least 10 per cent in accidents over 1936, and yet during the past year we have had one of the greatest road-building programs this country has ever enjoyed.

"Seventy-five per cent of all traffic accidents in urban areas are accidents against pedestrians. Elevated highways, would lift the traffic off the streets and would make pedestrian obstacles impossible, thereby eliminating that type of accident entirely.

"The conditions indicate beyond a doubt that the greatest need of the age is express highways that will serve the congested centers. They can be provided. They are economically possible. Engineering knowledge is today adequate to prove that."

Cost Not Prohibitive

According to Mr. Iden, elevated highways can be designed at a cost much less than street widening projects laid out to accommodate an equal flow of traffic, where it is necessary to condemn additional right of way to provide for the widening. A study made in Chicago showed that a six-lane elevated highway over streets, of steel construction with a concrete pavement, and designed to carry 20-ton trucks, would cost $1,066,000 per mile.

That included engineering material, contracting and all other costs, said the speaker. A four-lane highway was figured to cost $767,000 per

Steel for Stamina in Road Machinery

All available space in Cleveland Public auditorium was utilized last week for the 1938 road show, which proved to be one of the most successful held. Attendance totaled 27,000, and during the week contractors purchased equipment to the extent of $4,000,000. The illustration shows one section of the show

mile. If a steel deck were used, the four-lane highway would cost not over $667,000 per mile. A two-lane one-way highway was figured to cost $286,000.

Progress report of the problem committee on guard rail, presented by Chairman O. F. Goetz, chief engineer, department of highways and public works, Nashville, Tenn., dealt exclusively with metal guards. The committee is attempting to bring all guard rail regardless of design, type or detailed characteristics, under two strength classifications, namely, standard strength and heavy strength. Mr. Goetz declared that conditions have brought about need for a different type of rail and the service required from it.

The road show was a colorful exhibition, made so by the extreme size of machinery displayed and by the wide range of paint finishes, these including gray, orange, ochre, blue, yellow, black and white. A considerable portion of the equipment was operated, insofar as space limitations and other conditions would permit. Machines ordinarily driven by gasoline and diesel engines were temporarily powered with electric motors.

From year to year, it is possible to discern the improvements and trends in construction of road building machinery. In current equipment, a notable feature is that capacities have been increased considerably. This is due principally to two factors. One is the growing adoption of high-strength steels; the other is the increased efficiency of gasoline and diesel engines. The diesel, having reached a high state of perfection, is finding increasing applications, probably 75 per cent of the machines displayed were equipped with this type of power.

Viewed from the standpoint of the steel industry, it was everywhere evident that more and more alloy steel is being used by road machinery manufacturers in their equipment. This also has made it possible to design equipment for larger capacity and still to remain within clearance and weight specifications. More forgings are being employed to provide greater strength at decreased weight.

The almost universal use of shaping heavy sections by oxyacetylene cutting and assemblying various elements by welding have produced a new appearance in many machines and at the same time have enabled designers to obtain a moderate and pleasing degree of streamlining. Antifriction bearings have become standard, as have rubber tires for wheels regardless of size. To a layman, the dimensions of tires were spectacular. Wearing surfaces have their life increased by hard facing.

Exhibits of some manufacturers demonstrated that larger tonnages of steel are being used in highway expansion joints, in culverts, in curbs, in sheet piling and in temporary asphalt tanks.

Represented with exhibits in the show were eight producers of iron and steel and some 30 companies which manufacture steel products used in the building of road machinery.

ELEVATED HIGHWAY DESIGN CONTEST OPEN TO STUDENTS

■ Engineering and architecture students of recognized technical schools have been invited by the American Institute of Steel Construction to compete in a competition to design an elevated urban highway. The structure must be of steel and designed to carry through express vehicular traffic in a straight line along a marginal avenue.

Four lanes of traffic are to be provided, two in each direction divided by a curb. Each pair of lanes is to be 22 feet between curbs. No run-offs, entrances or exits are to be shown.

The competition for students is held annually and usually deals with a bridge design. Cash prizes of $150, $100 and $50 will be awarded by a jury of nationally-known authorities. Drawings must be received by the institute, 200 Madison avenue, New York, by April 9.

U. S. Iron Ore Output For 1937 Up 47 Per Cent

■ Iron ore output in the United States in 1937 increased 47 per cent over 1936, from 48,788,745 to 72,166,000 gross tons, according to estimates of the bureau of mines.

Ore shipped from mines last year is estimated at 73,339,000 gross tons valued at $208,749,000, an increase of 41 per cent in quantity and 58 per cent in total value compared with 1936.

Output of the Lake Superior district rose from 41,781,215 gross tons in 1936 to 61,687,000 in 1937, an increase of 47 per cent. Minnesota alone mined 48,210,000 gross tons in 1937, an increase of 16,575,936 gross tons or 52 per cent more than in 1936.

Mexico Raises Import Rates on Steel Products

■ Mexico's import rates on some iron and steel products have been appreciably increased, according to the department of commerce. Affected are barbed wire, iron and steel cable, tin plate, plain iron or steel sheets, tubes and pipes of certain diameters, pipe fittings, drums of iron or steel and cylinders.

Apollo 25 Years Old

■ Apollo Steel Co., Pittsburgh, will have its twenty-fifth anniversary this year.

The company began operations June 16, 1913 at Apollo, Pa., in a plant which was the first to have electrically-driven sheet mills. Original annual output was 30,000 tons of galvanized and corrugated sheets.

A. M. Oppenheimer, vice president when the company was founded, now heads the organization.

Better Machines Build Better Roads

Every type of machinery used in the construction of roads was displayed in the road show, some of the equipment being of extraordinary size. This field is growing in importance as a consumer of iron and steel and related materials

FINANCIAL

INVESTORS' HOLDINGS OF U. S. STEEL STOCK GAIN

■ Common stock of the United States Steel Corp. outstanding Dec. 31 amounted to 8,703,252 shares; preferred to 3,602,811.

Of the common stock 2,140,955 shares, or 24.6 per cent, were in brokers' names, representing a decrease of 105,209 shares since Sept. 30. Investors' common stock holdings were 6,562,297 shares, or 75.4 per cent as compared with 6,457,088 shares Sept. 30.

Of the preferred stock outstanding 398,391 shares, or 11 per cent were in brokers' names, a decrease of 9240 shares from Sept. 30. Investors' holdings of preferred amounted to 3,204,420 shares, or 88.94 per cent of the outstanding issue on Dec. 31 compared with 3,195,180 shares Sept. 30.

DIVIDENDS DECLARED

M. A. Hanna Co., Cleveland, has declared the regular quarterly dividend of $1.25 per share on $5 cumulative preferred stock, payable March 1 to stockholders of record Feb. 15.

Ludlum Steel Co., Watervliet, N. Y., has maintained dividend rate unchanged on the common stock. Directors recently voted a dividend of 25 cents a common share, payable Feb. 14 to record Jan. 31.

With net income of $2,235,756 for the full year 1937, equal to $3.21 a common share, directors of United States Pipe & Foundry, Burlington, N. J., declared four quarterly dividends of 50 cents each on common stock, for 1938. This compares with 75 cents in each of the preceding quarters during 1937, and will be made on March 19 to record Feb. 28, June 20 to record May 31, Sept. 20 to record Aug. 31 and Dec. 20 to record Nov. 30.

Reader Comments

(*Concluded from Page* 9)

line of business, but primarily an effort to guarantee continuity of employment to all their employes. There was quite an air of optimism on the part of all, that the confused tax condition would gradually be remedied. It is a very heavy burden on industry and undoubtedly before we get through will be heavier, but there seemed to be a strong feeling that it would be simplified by more uniform state laws.

The meeting was not particularly optimistic on current business but seemed to feel that 1938 would be much better than present conditions would indicate. When one reads some of the national labor board reports in the newspapers he would think there was a very distinct cleavage between employer and employe, but as I reflect on the discussions of these men, all large employers, I do not recall any such tone of ideas. They are so close to production and sales that they fully realize the necessity of co-operation with labor and every effort toward harmony.

TOM R. WYLES
Executive Director,
Steel Plate Fabricators Association, Chicago

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Jan. 22	Change	Same week 1937	Same week 1936
Pittsburgh ..	26	+ 1.5	81.5	37.5
Chicago	27.5	+ 1	77	53
Eastern Pa...	31	None	53	36.5
Youngstown..	28	+ 3	79	61
Wheeling	51	+16	93.5	70
Cleveland ...	26	+ 2	78	67
Buffalo	23	None	84	30
Birmingham..	60	— 3	76.5	51
New England	20	— 6	88	83
Cincinnati ...	32	+ 4	68	75
St. Louis.....	21	None	76	†
Detroit	52	None	95	88
Average....	30.5	+ 1.5	80	50

†Not reported.

Steel Engineers To Inspect J. & L.'s Mill

■ Members and guests of the Association of Iron and Steel Engineers will inspect Jones & Laughlin Steel Corp.'s new continuous hot and cold strip mill at Pittsburgh, Wednesday afternoon, Jan. 26. More than 500 are expected.

In the evening, following an informal dinner at 6:45 o'clock, the Pittsburgh district section of the association will hold a technical meeting in the Chatterbox, William Penn hotel. Prof. W. Trinks, Carnegie Institute of Technology, will discuss "Forty Years of Rolling Mill Engineering."

Carloadings Expected To Drop in First Quarter

■ Although estimates of carloadings in the first quarter of 1938 indicate a decline of 8.3 per cent in the country, and 11 per cent in the Great Lakes region, carriers expect to haul 6.6 per cent more farm implement carloads, according to forecasts by the regional shippers' advisory board.

Total iron and steel shipments are expected to decline 30.3 per cent; machinery and boilers, 12.5 per cent; automobiles, trucks and parts, 12.4 per cent; ore and concentrates 25.6.

PRODUCTION

■ SLIGHT gains in several important centers, with moderate recessions in two others, lifted the national steelworks operating rate last week 1.5 points to 30.5 per cent of capacity. The outlook is for a higher rate this week.

Youngstown, O. — Advanced 3 points to 28 per cent as Republic Steel Corp. resumed partial operation of its bessemer plant and Youngstown Sheet & Tube Co. added an open hearth. This gives a total of 31 open hearths and two bessemer converters on partial schedule. Indications are that the rate will be unchanged this week.

Pittsburgh — Advanced 1.5 points to 26 per cent, with mills on an irregular schedule. Expectation is for slight improvement this week.

Wheeling — Added open hearths have brought operations up 16 points to 51 per cent.

Central eastern seaboard — Unchanged at 31 per cent. One mill has lighted an additional open hearth but this has been offset in other directions.

St. Louis— For the third consecutive week unchanged at 21 per cent. Additional open hearths will be lighted at the beginning of February.

Cincinnati — Up 4 points to 32 per cent with a further increase likely for this week.

New England—Off 6 points to 20 per cent with schedules for this week probably unchanged. A 100-ton furnace planned for lighting last week will not be put into service until February.

Birmingham, Ala.—Down 3 points to 60 per cent by loss of one open hearth.

Detroit — Steady at 52 per cent, with 11 furnaces out of 21 melting. Four new open hearths under construction here will not be completed for several months.

Chicago—Increased 1 point to 27½ per cent, the best rate in six weeks but the lowest for the corresponding period since 1933.

Buffalo—Unchanged at 23 per cent.

Cleveland—Gained 2 points to 26 per cent with probability of two more open hearths being lighted at the beginning of this week.

■ Total zinc production for 1937 increased 12.75 per cent over 1936 but was still below 1929 figures, according to the annual review of the industry, recently issued by E. V. Gent, secretary, American Zinc Institute Inc. Tonnage for the year was 589,932 compared with 523,166 in 1936.

Rise and Fall of Rail Exports

■ EXPORT of steel rails, long an important factor in the American steel industry's foreign business, has been declining in recent years, more so than can be accounted for by the depression, and due in large measure to the developed state of world transportation facilities, according to a study by the metals and minerals division, department of commerce.

However, the division believes a number of countries, notably China, Brazil and Africa, will continue to be important markets for a considerable period.

The industry in this country entered a new era in 1882 when steel rails were first offered at a lower price than iron rails, and the latter began to disappear. From that time steel rails formed the major part of demand.

By 1888 output in the United States had increased to a point exceeding domestic requirements, and export outlets were sought. The United Kingdom had monopolized the steel rail export markets, but the American product soon became an important item. Rapid development of transportation facilities in the Far East, Central and South America, the West Indies and Canada called for heavy exports. In 1898 American rails were sold in eight foreign countries, and in 1907 in 32.

1919 Record Year

Export sales fluctuated greatly from year to year during the early part of the century but gradually increased until 1919, when the record tonnage of 652,443 tons was reached. The period from 1911 to 1919 was the most important in this trade, annual exports averaging about 500,000 tons. From the latter year exports have declined sharply. Only 93,111 tons were shipped abroad in the first ten months of 1937.

Self-sufficiency in former important markets, and excess production for export in these countries accounted for the change. Keen competition was met by rail producers in the United Kingdom, Germany, France, Belgium-Luxemburg, Poland and Japan.

Canada formerly was an important buyer of American rails but has developed a domestic industry sufficient to supply its own needs, and in 1936 exported 36,000 tons. Japan's purchases have decreased in proportion to expansion in its own production, and that country also has been shipping considerable tonnage to certain countries. Mexico formerly was a large buyer from the United States, but in recent years has supplemented by imports from European countries. In the first ten months of 1937, however, our rail shipments to Mexico increased, due to curtailment of supplies from Europe.

The department of commerce concludes that it is not probable export trade in steel rails from the United States will assume, under normal conditions, the levels attained in the early part of the century and in the years following the World war.

Of some 80,000,000 tons of steel products exported since 1900 steel rails totaled 10,077,954 gross tons, or 12.6 per cent. Canada in these years bought 1,563,000 gross tons, Japan 1,220,000 tons, Mexico 570,000 tons; Brazil, the Philippines, China, Chile and Argentina, smaller totals to an aggregate of 4,578,000 tons. The remainder of our rail shipments were distributed to countries taking much smaller lots.

William B. Pollock Co. Celebrates 75th Year

■ Seventy-five years of building blast furnaces and iron and steelworks equipment is being celebrated this year by the William B. Pollock Co., Youngstown, O.

Founded by William B. Pollock, the company still is owned and operated by the Pollock family. William B. Pollock II, grandson of the founder, is president.

Workers in the plant practically are considered "members of the family." Of the regular force numbering about 160 men, 19 have been in continuous employ more than 30 years. Nearly half have been with the company more than 20 years.

In planning commemoration of the diamond anniversary, William B. Pollock II remembered employes first. Each received a check, a letter of felicitation, and a bronze medal issued for the occasion. The medals, which were distributed personally by the president, depict a modern blast furnace, Republic Steel Corp.'s Trumbull-Cliffs stack at Warren, O., built by the company. On the reverse side is a modern Pollock hot metal car.

Founder William B. Pollock obtained an early start in constructing and operating blast furnaces and is credited with building the first stacks in Chicago and St. Louis. In 1863 he organized a boiler works at Youngstown; this soon was converted into a blast furnace manufacturing concern, which designed and constructed many stacks in the United States and in foreign countries.

An inventor from boyhood, Mr. Pollock contributed many developments still in use. He invented and built the first iron-plate hot blast stove and devised a method of "raising" blast furnaces, bridges, hoist houses and piping simultaneously to increase capacity without tearing down the furnace.

The company built the first steel plant in Youngstown for the Ohio Steel Co., now the Ohio works of Carnegie-Illinois Steel Corp. Later attention was turned to building large ladles and ladle cars and the concern now is one of the largest builders of this equipment.

Second generation of the family was represented in the company by Porter Pollock who succeeded the founder as president. William B. Pollock II entered the company in 1927 and now represents the third generation as president.

Reviews Economics of Iron, Steel Industry

■ Pamphlet No. 15, "Steel—Problems of a Great Industry," is the latest of a series of publications by Public Affairs Committee Inc., 8 West Fortieth street, New York. It is a 32 page review of the two-volume study, "The Economics of the Iron and Steel Industry," focused on problems of the NRA steel code. This study was conducted by the Bureau of Business Research and the University of Pittsburgh, and a digest was presented in STEEL, Feb. 22, 1937, page 17.

Various characteristics of the industry are discussed under such headings as products and processes, overhead costs, markets, the price problem, prices under the NRA, labor conditions, unemployment and living conditions, labor unions and collective bargaining. Copies of the pamphlet are obtainable from the committee at 10 cents each.

■ Gross business transacted by the federal housing administration has passed the $2,000,000,000 mark. Approximately $650,000,000 was transacted during 1937.

MEN OF INDUSTRY

■ FREDERICK W. WERNER, employed by United States Steel Corp. and subsidiaries since July, 1907, and closely allied with the chemical activities of the steel industry, has been appointed assistant to C. V. McKaig, vice president, United States Steel Corp. of Delaware, and will have charge of sales of by-products. Mr. Werner's headquarters will be in New York.

♦

R. A. Hendrickson has been appointed manager of the oil sales section, Crane Co., Chicago.

♦

C. R. Phillips, recently receiver of the Missouri-Kansas Pipe Line Co., has been elected president, Automatic Products Corp., Chicago.

♦

R. S. Hill, Stanley Wilder and M. J. McHenry have been admitted as partners of the Hetz Construction Co. Inc., steel constructors, salvagers of industrial plants, and dealers in scrap materials, Warren, O.

Mr. Hill has been elected vice president in charge of operations; Mr. Wilder, vice president in charge of contract work and legal matters, and Mr. McHenry, vice president in charge of sales. This is in line with the company's program for enlarging the scope of its operations.

Mr. Hill formerly was superintendent of labor at the Newburgh (Cleveland) plant of the American Steel & Wire Co., and also his additional duties of handling raw materials, especially scrap, at the Newburgh plant, qualified him for his new position. He is the son of Charles Hill, who recently resigned as general superintendent of the Newburgh plant and Central furnace.

Mr. Wilder will give up a law practice to become associated with the Hetz company. He was graduated from Ohio State university and ranked high in the bar examination of 1935. He is the son of John Wilder, president, Wilder Mfg. Co., Niles, O. Mr. McHenry was for several years assistant manager, salvage division, Republic Steel Corp.

F. W. Werner

♦

Frank M. Daughety has been appointed comptroller, Peter A. Frasse & Co. Inc., New York. Mr. Daughety was formerly comptroller of the mortgage commission of the state of New York.

♦

Clarence E. Jacobsen has been elected vice president in charge of of eastern territory, Chicago-Latrobe Twist Drill Works. His offices will be in the Public Ledger building, Philadelphia.

♦

Arthur Hodges has been transferred from the main plant of National Supply Co., Torrance, Calif., to serve as field engineer for the company in the oil field district of Bakersfield, Calif.

♦

Harry W. Wheatley, district representative in the central Ohio territory for Empire Sheet & Tin Plate Co., Mansfield, O., has been transferred to Indianapolis, with offices in the Illinois building.

♦

Karl A. Pauly has retired as engineer of the industrial department, General Electric Co., Schenectady, N. Y., after 39 years' continuous service. He will, however, continue to serve the company in a consulting capacity.

♦

Edward C. Mayer, for several years assistant advertising manager, Harnischfeger Corp., Milwaukee, has resigned to become editor of publications of the Baroid Sales Co., Los Angeles, subsidiary of National Lead Co.

♦

Bruce K. Brown has been appointed general manager in charge of research and development activities, Standard Oil Co. of Indiana, Chicago. He will continue his present duties as manager of the development and patent department.

♦

Robert M. Onan has joined the sales staff of the refractories section, abrasive division, Norton Co., Worcester, Mass. His headquarters will be in the Chicago office, and he will cover Illinois, Wisconsin, upper Michigan, Indiana and Missouri.

♦

Raymond L. Lansing and Benjamin H. Gilpin have been appointed general manager and works manager, respectively, of the new manufacturing plant of the Bendix, N. J., division of Bendix Aviation Corp., Chicago.

♦

B. H. Lawrence has been appointed chief engineer, United States Steel Corp. of Delaware, with headquarters in Pittsburgh. He formerly held a similar position with American Steel & Wire Co., and recently has been assistant to John Hulst, vice president, United States Steel Corp. of New Jersey, in New York.

♦

G. D. Deabler has been named resident manager, Indianapolis office, Austin Co., engineers and builders. He will direct activities in the central and southern portions of the state. Mr. Deabler has represented the Austin organization in southern Indiana the past two years and has been with the company since 1927.

♦

E. F. Judge has been elected vice president and treasurer, Scullin Steel Co., St. Louis. He succeeds the late Charles L. Gilbert. W. H. Chickey has been named secretary,

M. J. McHenry

Stanley Wilder

R. S. Hill

and William J. Monahan, assistant secretary.

♦

Stuart M. Crocker, vice president, International General Electric Co. since 1930, has assumed the added responsibilities of assistant to Charles E. Wilson, new executive vice president of General Electric Co., Schenectady, N. Y.

♦

Clarence H. Beach has been named district sales representative for Newport Rolling Mill Co., Newport, Ky. He will be located at 305 Merchants National Bank building, Indianapolis. Assisting Mr. Beach will be P. J. Shreve.

♦

Joseph A. Messenger, well known in utility construction work, and formerly associated with United Engineers & Constructors Inc., in charge of pipe line construction, has become associated with Buell Engineering Co. Inc., New York, as general manager.

♦

John S. Hayes, active in the power plant field in the northwestern Ohio territory for a number of years, has become district representative in that territory for Elgin Softener Corp., Elgin, Ill., handling water conditioning equipment. His office is at 1508 River road, Maumee, O.

♦

Thomas J. Watson, president, International Business Machines Corp. and International Chamber of Commerce, has received the Belgian Order of the Crown, Rank of Commander, in recognition of efforts to promote world peace through world trade.

♦

Steward Rose, for the past several years, assistant purchasing agent for the Western Pipe & Steel Co., San Francisco, has been appointed purchasing agent. He succeeds Ralph Petillon, who recently resigned to become associated with the Ducommun Metals & Supply Co., Los Angeles.

♦

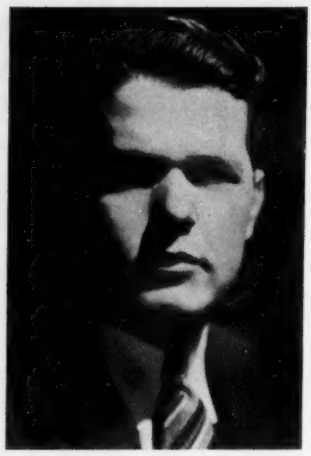
Frederick T. Robertson, associated with the Lewis Bolt & Nut Co., Minneapolis, has been elected vice president. After obtaining his engineering degree, Mr. Robertson worked for the Canadian Pacific and the Burlington railroads, later for Cansoer, Older & Quinlan, consulting engineers.

♦

Hyman Moskowitz, Moskowitz Bros., Cincinnati, has been elected president, Cincinnati chapter, Institute of Scrap Iron and Steel Inc. Other officers are: Vice president, M. Duberstein, Duberstein Iron & Metal Co., Dayton, O.; secretary-treasurer, Roy Price, Hickman, Williams & Co., Cincinnati.

♦

Robert L. Hamilton, advertising and sales promotion manager, Dumore Co., Racine, Wis., maker of



Robert L. Hamilton

universal motors and lathe grinders, has been assigned the duties of sales manager. In this capacity he succeeds Leland B. Augustine who has resigned to take charge of Dumore sales in the Chicago district. Mr. Hamilton became associated with the Dumore organization shortly after graduation from the college of commerce, University of Notre Dame, in 1934.

♦

Edwin A. Wert, of the Detroit-Edison Co., has been retained by the Power Piping division of Blaw-Knox Co., Pittsburgh, as consulting engineer. A member of the American Society of Mechanical Engineers, he has been engaged in pipe designing the past 20 years and is the author of several books on piping flexibility.

♦

John H. Fogwell, Pittsburgh manager of Scully Steel Products Co., has been elected national director, Pittsburgh chapter, American Steel Warehouse association Inc., to serve the unexpired term of T. A. Harper, who recently became manager of the Newark, N. J., warehouse of Edgar T. Ward's

William S. Guy

Recently named acting traffic manager United States Steel Corp. of Delaware, as reported in STEEL, Jan. 10, page 23

Sons Co. D. Davia, Bethlehem Steel Co., Carnegie, Pa., has been made secretary of the chapter.

♦

Marcus A. Follansbee, in charge of the Chicago office of Follansbee Bros. Co., Follansbee, W. Va., the past 20 years, has been named general manager of sales, with headquarters at the home offices. Except for a year's service during the World war, Mr. Follansbee has been continuously associated with the Follansbee organization since graduation from the School of Mines, University of Pittsburgh, in 1914.

♦

Harry J. Kiener, Hickman, Williams & Co., St. Louis, has been elected president, St. Louis chapter, Institute of Scrap Iron and Steel Inc. Other officers include: First vice president, Gus Gillerman, Gus Gillerman Iron & Metal Co., St. Louis; second vice president, C. C. Cohen, I. J. Cohen & Co., Kansas City, Kans.; third vice president, Hyman Cohen, Standard Steel & Rail Co., St. Louis; secretary-treasurer, Fred S. Fuld, Harry Benjamin Equipment Co., St. Louis.

♦

Dr. Chauncey Guy Suits, research physicist, General Electric research laboratory, has been selected as America's outstanding young electrical engineer for 1937, as announced by Eta Kappa Nu, honorary electrical engineering fraternity. He was selected from 60 candidates less than 35 years of age, submitted by industrialists and educators. The award will be presented at the convention of the American Institute of Electrical Engineers in New York, Jan. 28.

♦

Harry T. Bennett, Des Plaines, Ill., who has spent 40 years in the steel industry, has retired as special sales representative of Carnegie-Illinois Steel Corp. He started 53 years ago with the Northwestern railway, later being associated with two steel jobbing companies, following which he became office manager of the Chicago warehouse, Falcon Iron & Nail Co. This company then merged with others into the American Sheet Steel Co., which in turn was merged with the American Sheet & Tin Plate Co. Mr. Bennett served as a salesman in the new organization, advancing to manager of sales, a position he held until 1936 when the company became a part of Carnegie-Illinois Steel Corp.

♦

A. L. Bergstrom, chief works engineer, Timken Roller Bearing Co., Canton, O., has been appointed executive engineer. A graduate of the Royal Technical Institute of Sweden, Mr. Bergstrom spent several years with the Krupp organization in Germany. After a number of years in design work in this country he became associated with Tim-

ken in 1929 in the works engineering department.

The following promotions also were announced: R. M. Riblet to chief engineer, automotive division; J. B. Baker to assistant chief engineer of the automotive division and chief engineer, rock bit division; S. M. Weckstein, chief engineer, industrial division; H. C. Edwards, chief engineer, fuel injection equipment division; W. C. Makley, chief works engineer, and E. J. Reagan, general service manager.

DIED:

■ ROBERT S. BROWN, 51, advertising executive and prominent in the railway supply industry, at his home in Rutherford, N. J., Jan. 17. He was vice president and treasurer G. M. Basford Co., New York, advertising agents, with whom he was associated since 1916.

Mr. Brown was a graduate of Pratt institute, 1909, and was employed in the engineering office of the Erie railroad, 1909-1915. In recent years he specialized in work for the American Arch Co., Franklin Railway Supply Co., Lima Locomotive Works, Superheater Co., Standard Stoker Co. and others. He was a member, Engineers club, Transportation club and Railway club, New York.

♦

Paul K. Rogers, president and treasurer, Skinner Chuck Co., New Britain, Conn., in that city, Jan. 11.

♦

E. J. O'Brien, 37, manager of the Chicago office of Harnischfeger Co., in Cleveland, Jan. 20, while attending the American Road Builders association convention.

♦

Joseph A. Burger, 74, president and founder, Burger Iron Co., Akron, O., Jan. 15. He retired from active work three months ago, after having been president for 25 years.

♦

Hugh Clinton Cushwa, 62, auditor and assistant secretary, and also a director, National Tube Co., Pittsburgh, in that city, Jan. 20. He had been associated with the company almost 40 years.

♦

Franc H. Burnett, 60, claims agent for Bethlehem Steel Co., Bethlehem, Pa., in that city, recently. He had been continuously associated with the steel industry since graduation from high school. In 1904 he joined the former Lackawanna Steel Co., as assistant purchasing agent, and following acquisition of Lackawanna by Bethlehem Steel in 1922, he was appointed assistant to the general manager of that plant. He was transferred to Bethlehem as claims agent in 1926.

Robert S. Brown

♦

George W. Smith, 75, president and general manager, Sterling Steel Foundry Co., Braddock, Pa., in Braddock, Jan. 4. He entered the steel foundry business in 1902, and in 1911 purchased the Sterling Steel Foundry Co.

♦

Charles Prescott Rees, 60, vice president in charge of mining operations, Vanadium Corp. of America, New York, at his home in Yonkers, N. Y., Jan. 19. Mr. Rees directed all the corporation's mining operations. He was associated with the Vanadium corporation since 1925, becoming vice president in 1929. He was also a director of the company.

♦

Henry W. Heedy, 87, industrialist and philanthropist, in Youngstown, Jan. 14. He was one of the last members of the old-time ironmasters, active when the Mahoning and Shenango valleys were the centers of the blast furnace and puddled iron industries of eastern Ohio and western Pennsylvania. At the time of his death he was president, Union Limestone Co., New Castle, Pa., and New Castle Lime & Stone Co.

In 1892 Mr. Heedy was named secretary and assistant treasurer, Andrews Bros. Co., and a year later treasurer. He remained in that position until the Andrews company was merged in the Republic Iron & Steel Co. in 1899. He then joined Andrews & Hitchcock Co. as secretary-treasurer, remaining there until it was absorbed in 1917 by Youngstown Sheet & Tube Co. Mr. Heedy was one of the original directors, Youngstown Iron & Steel Roofing Co., which later changed its name to Youngstown Iron & Steel Co. in 1910, and in 1917 was absorbed by the Sharon Steel Hoop Co., now Sharon Steel Corp.

Activities of Steel Users, Makers

■ W. C. LIPE INC., Syracuse, N. Y. has bought the lathe division of Porter-Cable Machine Co., also of Syracuse. Manufacture of the Porter-Cable 9-inch production lathe, mechanical Carbo and hydraulic Carbo lathes will be continued without change. Porter-Cable Machine Co. will devote its facilities to portable tools for woodworking, including sanders, saws and polishers. The Lipe company will use its entire plant on Geddes street for manufacturing lathes, with its Wyoming street plant enlarged by leasing additional space for heavy duty automotive clutches.

♦

American Rolling Mill Co., Middletown, O., will spend $175,000 to improve its Ashland, Ky., plant, including work on blast furnaces and purchase of new equipment.

♦

General Alloys Co., Boston, maker of heat and corrosion resistant alloy castings, has appointed George O. Desautels Co., of Indianapolis and Muncie, Ind., as its sales representative for central Indiana territory.

♦

L. L. Richards Machinery Co., Milwaukee, has recently been organized by L. L. Richards, formerly general manager of Badger-Packard Machine Co., Milwaukee, to handle machine tools, specializing in metalworking equipment. Associated with Mr. Richards is C. R. Daniels, formerly in the sales department of Joseph T. Ryerson Sons Co.

♦

R-S Products Corp., Philadelphia, has taken over the manufacturing and sales rights of the Mehler valve and burner equipment, developed by Dr. Carl J. Mehler, Pittsburgh, and previously distributed under the title of Mehler Inc. The R-S Products Corp. will enlarge the Mehler line of nonclogging, volume registering oil and gas valves.

♦

Hetz Construction Co. Inc., Warren, O., salvager of industrial plants, has purchased the Richmond, Va., plant of American Locomotive Co. The plant includes a number of steel buildings and various electric cranes. The Hetz company also has purchased the equipment and cranes on the East River yard of the Church E. Gates & Co. lumber dock, New York, comprising a large assortment of woodworking machines and ten electric yard cranes.

Continued Expansion Is Predicted In Use of Compressed Gases

■ SUBSTANTIAL progress in the compressed gas industry over the past 25 years and particularly in the last decade was reported by speakers at the twenty-fifth annual and silver jubilee meeting, Compressed Gas Manufacturers' association, Waldorf-Astoria hotel, New York, Jan. 17-18.

Production of compressed gases and applications of these gases have increased tremendously, and further expansion seems assured.

Attended by about 400, the first meeting was closed except to members, and the second day was devoted to two open sessions and the annual banquet. Speakers at the dinner were Judge Isaac Nelson Meekins, United States district court, who spoke on "The Law Makes the King"; and E. M. Allen, president, Mathieson Alkali Works Inc., New York, and president, Manfacturing Chemists' association, who delivered an address on "Statesmanship in Modern Business." John Motley Morehead, former United States ambassador to Sweden, was toastmaster.

Elect New President

John J. Crowe, manager of the apparatus, research and development department, Air Reduction Co., New York, was elected president of the association to succeed E. A. Faulhaber, executive vice president, Compressed Industrial Gases Inc., Chicago.

P. F. Lavendau, New York, vice president and director, Liquid Carbonic Corp., Chicago, was elected first vice president; and Dr. F. C. Ziesberg, vice president in charge of development, E. I. du Pont de Nemours & Co., Wilmington, Del., second vice president. J. R. Fetherston, 11 West Forty-second street, New York, was re-elected secretary and treasurer.

New members of the executive board, which now comprises 28, include H. S. Bunn, Carbide & Carbon Chemicals Corp., New York, who replaces D. J. King as representative of his company; and Dr. Ziesberg, who replaces Thomas Coyle as representative of the E. I. du Pont company. Mr. Faulhaber replaces H. P. Pearson as representative of Compressed Industrial Gases Inc. Another new member is D. S. Pritchard, Canadian Industries Ltd., Montreal.

Broadening application of liquefied petroleum gases was indicated by Mercer G. Farrar, Carbide & Carbon Chemicals Corp., New York, who said that sales for the industry increased from 222,641 gallons in 1922 to 106,652,000 gallons in 1936, the principal gain falling within the past ten years, as indicated by a figure of 1,091,065 gallons for 1927.

It was also revealed that last year's sales amounted to approximately 125,000,000 gallons, and R. W. Thomas, Phillips Petroleum Co., New York, estimated that on an average over the next five years annual consumption will be increased by 10,000,000 gallons for bottle gas customers and 15,000,000 gallons for industrial consumers. He thought the saturation point would not be reached for at least another 15 years.

John J. Crowe

Elected president, Compressed Gas Manufacturers' association

Commenting on progress in the past ten years, Mr. Farrar said the application of liquefied petroleum gases has been extended to practically every fuel gas requirement, not only in the home, but in industry. In addition, he declared, many spe-

(*Please turn to Page* 48)

Bottled Gas Association Changes Its Name

■ National Bottled Gas association, New York, last week changed its name to Liquefied Petroleum Gas association. This association will hold its first meeting, which will be the postponed annual convention of the former society, St. Louis, March 21-22. Officers will be elected and an executive board chosen for the current year.

The association is affiliated with the Compressed Gas Manufacturers' association, Inc.

Officers are W. F. Verkamp, president; F. B. Boice and A. N. Kerr, vice presidents, and F. R. Fetherston, secretary-treasurer.

New High in Industrial Gas Consumption

■ Amount of gas used in industry and commerce has been at an all-time high during the past two years and considerably above the pre-depression years. Hale A. Clark, chairman of the industrial gas section, American Gas association, reports gas utilities sold 1,090,310,000,000 cubic feet of industrial and commercial gas, manufactured and natural, during 1937. This is a gain of 10 per cent over 1936 and is double the rate of increase in industrial production and commercial activity as reported to the federal reserve bank.

New Chapter Added to Foundrymen's Group

■ D. J. Reese, International Nickel Co., was selected chairman of the newly-formed Metropolitan chapter, American Foundrymen's association, at an organization meeting in Newark, N. J., Jan. 17. W. E. Day, Mack Truck Inc. was named vice chairman, and T. J. Wood, Robins Conveying Belt Co., secretary-treasurer.

This, the twelfth A.F.A. chapter, will devote itself to educational activities rather than to trade practices, the officers state.

Hyman Bornstein, director, testing and research laboratories, Deere & Co., Moline, Ill., and president of the American association, served as organizing chairman and was the chief speaker. Marshall Post, vice president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., and vice president of the national association, and Harold Henzey, Carborundum Co., Philadelphia, president of Philadelphia chapter, also spoke.

Foundry Equipment Sales Continue To Decline

■ Orders for foundry equipment in December were lower than in November, continuing the downward movement of several months, according to Foundry Equipment Manufacturers' association, Cleveland. Index of net orders was 111.2 in December, 128.03 in November, and 283.3 in December, 1936.

Shipments also declined, the December index, 159.8, compared with 178.8 in November and 187.1 in December, 1936. Unfilled orders index for December was 245.5, against 294.0 in November, and 319.6 in December, 1936.

MEETINGS

PROGRAM ANNOUNCED FOR DEL MONTE CONFERENCE

■ MAJOR problems and plans for future advancement of the iron and steel industry on the Pacific coast will be considered at the fourteenth annual iron and steel conference under the auspices of the California state chamber of commerce, in Hotel Del Monte, Del Monte, Calif., Feb. 10-12.

E. H. McGinnis, Union Hardware & Metal Co., Los Angeles, conference chairman, will preside at the first session, Thursday morning. For this session the program committee has scheduled addresses in the following order: "Industrial Statesmanship—Yesterday, Today and Tomorrow," by E. L. Shaner, editor-in-chief, STEEL, Cleveland; "Meeting California's Problems," by Norman H. Sloane, general manager, California state chamber of commerce; "Industrial Management Problems," by T. M. Girdler, chairman, Republic Steel Corp.; "Profit and Loss," by Rev. Brewster Adams, Reno, Nev.

Group meetings will be held in the afternoon. In the evening two sound pictures will be exhibited, "Steel," courtesy of the American Iron and Steel institute, and "Backbone of Progress," courtesy of the American Institute of Steel Construction.

B. J. Osborne, Moore Dry Dock Co., Oakland, will preside at the meeting Friday morning, featuring an "iron and steel clinic." Frederick J. Koster, California Barrel Co., San Francisco, will speak on "California's No. 1 Tax Problem as It Relates to Industry," and C. B. Tibbitts, Los Angeles Steel Casting Co., Los Angeles, on "How Industry Can Co-operate to Reduce Unemployment Insurance Costs." The banquet will be in the evening.

The closing day, Saturday, will be devoted to informal meetings and golf.

PLANS SHAPING UP FOR WESTERN METAL MEETING

Technical program for the third Western Metal congress in Los Angeles, March 21-25, under auspices of the American Society for Metals is being arranged around the theme "Metals in Industry," with particular attention being directed upon metals used in the petroleum, aviation, general manufacturing, chemical and mining industries. Approximately 50 papers will be presented at ten sessions in the Biltmore hotel. Dr. Donald S. Clark, California Institute of Technology, is chairman of the committee arranging the program.

A feature of the congress will be an educational course of five lectures on the "Fundamentals of Ferrous Metallurgy," to be presented by Dr. A. Allan Bates, formerly professor of metallurgy, Case School of Applied Science, Cleveland, and now manager of the chemistry and metallurgical division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Eighteen national technical societies are co-operating in the congress. During the week, the American Welding society, American Society of Mechanical Engineers and Pacific Coast Gas association will meet independently in their own sessions.

Up to Jan. 10 approximately 100 companies had reserved space in the Western Metal exposition to be held at the Pan-Pacific auditorium in connection with the congress. Many of these companies are located in the eastern part of the United States. W. H. Eisenman, secretary of the American Society for Metals, is exposition manager.

A.F.A. ARRANGES PROGRAM FOR ANNUAL MEETING

Thirty-five sessions dealing with management, technical problems, production and shop practice in the steel, malleable, gray iron and nonferrous foundry industry are scheduled for the forty-second annual convention of the American Foundrymen's association, Public Auditorium, Cleveland, May 16-19. The foundry exhibition will open for advance inspection Saturday, May 14, and remain open during the convention.

Convention sessions of primary interest to gray iron and nonferrous foundrymen will be held on the first two days, those for steel foundrymen on the second and third days, and for malleable foundrymen on the third and fourth days. A management series of sessions will feature speakers on apprentice and foreman training, safety and hygiene, melting costs, job evaluation and time study. General interest technical sessions will be devoted to refractories, sand research and control, pattern making and materials handling.

Three shop operation courses are being organized to cover malleable founding, cast iron founding and sand control, the malleable course being offered for the first time.

W. J. Rees, head of refractories department, University of Sheffield, Sheffield, England, will present the exchange paper of the Institute of British Foundrymen.

PITTSBURGH TRAFFIC CLUB MEMBERS PLAN DINNER

Traffic Club of Pittsburgh will hold its thirty-seventh annual dinner Jan. 28 at the William Penn hotel, Pittsburgh.

Convention Calendar

Jan. 23-28—Canning Machinery and Supplies association. Annual convention and exposition at Stevens hotel, Chicago. S. G. Gorsline, Merchandise Mart, Chicago, is secretary.

Jan. 24-26—National Warm Air Heating and Air Conditioning association. Semiannual convention at Roosevelt hotel, New York. A. W. Williams, 50 West Broad street, Columbus, O., is managing director.

Jan. 24-28—American Society of Heating and Ventilating Engineers. Annual convention and exposition at Grand Central Palace, New York. A. V. Hutchinson, 51 Madison avenue, New York, is secretary.

Jan. 24-28—American Institute of Electrical Engineers. Annual winter meeting at Engineering Societies building, New York. H. H. Henline, 33 West Thirty-ninth street, New York, is secretary.

Jan. 25-27—American Society of Refrigerating Engineers. Annual meeting at Roosevelt hotel, New York. D. L. Fiske, 37 West Thirty-ninth street, New York, is secretary.

Feb. 3-4—American Foundrymen's association. Regional meeting at Hotel Schroeder, Milwaukee, under auspices Milwaukee chapter and co-operation of mining and metallurgical school, University of Wisconsin.

Feb. 8—Foundry Equipment Manufacturers' association. Annual meeting at Cleveland hotel, Cleveland. A. J. Tuscany, 632 Penton building, Cleveland, is executive secretary.

Feb. 9-10—Steel Founders' Society of America. Annual meeting at Hotel Cleveland, Cleveland. R. L. Collier, 920 Midland building, Cleveland, is secretary.

Feb. 10-12—Iron, Steel and Allied Industries of California. Fourteenth annual conference at Del Monte, Calif. C. S. Knight, director, industrial department, California State chamber of commerce, San Francisco, is secretary.

March 9—American Society for Testing Materials. Regional meeting at Seneca hotel, Rochester, N. Y., in conjunction with spring group meetings of committees, March 7-11. C. L. Warwick, 260 South Broad street, Philadelphia, is secretary.

March 9-12—American Society of Tool Engineers. First national convention and exhibition at Convention Hall, Detroit. Ford R. Lamb, 5928 Second boulevard, Detroit, is executive secretary.

March 10-11—Society of Automotive Engineers. National aeronautic meeting at Mayflower hotel, Washington. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary and general manager.

March 14-15 — National Association of Waste Material Dealers. Annual meeting at Hotel Astor, New York. C. M. Haskins, 1109 Times building, New York, is secretary.

March 21-25—American Society for Metals. Third Western Metal congress and exposition at Pan-Pacific auditorium, Los Angeles. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

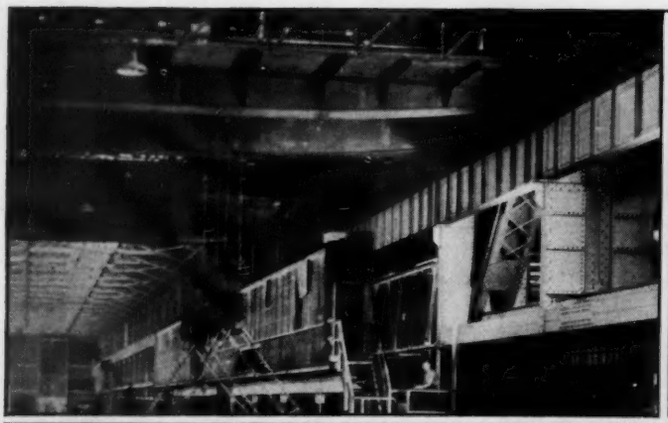
March 27—April 2—American Ceramic society. Annual convention at Roosevelt hotel, New Orleans. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

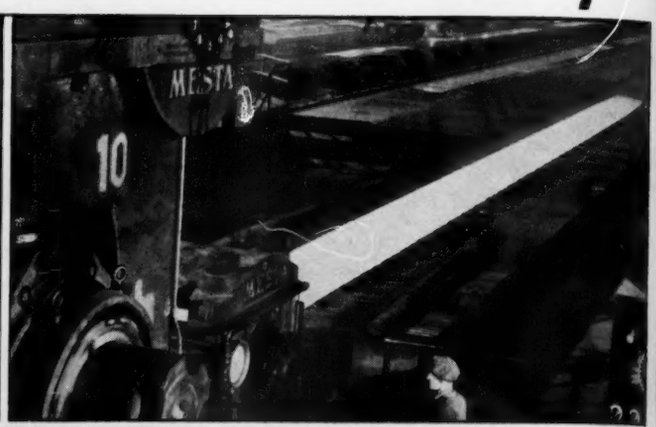
March 21-25—American Welding society. Regional meeting of Pacific Coast sections at Biltmore hotel, Los Angeles.

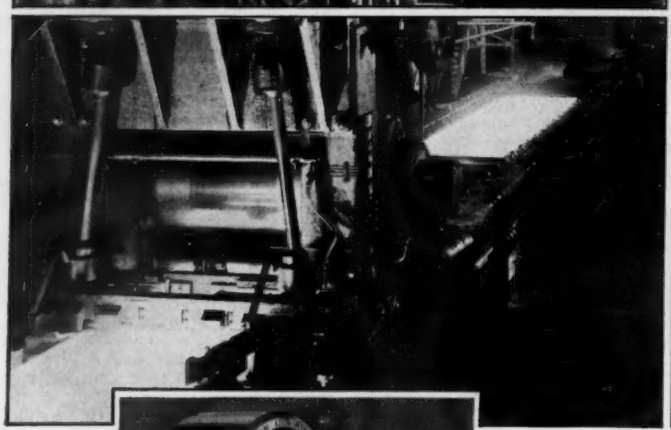
March 23-25—American Society of Mechanical Engineers. National spring meeting in Los Angeles. C. E. Davies, 29 West Thirty-ninth street, New York, is secretary.

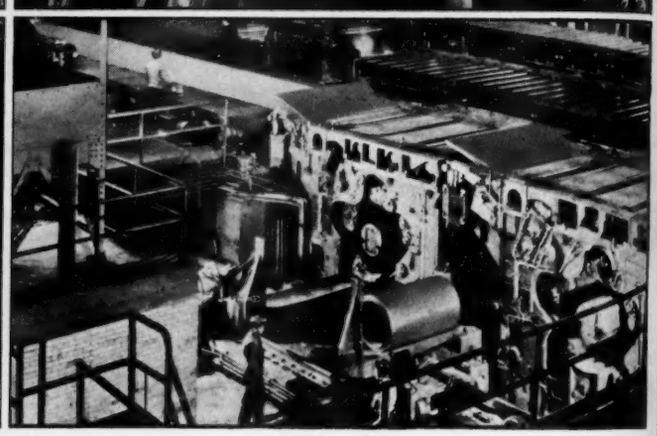
As You Would Expect...

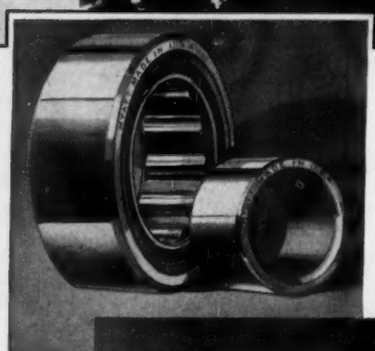
HYATT *Roller Bearings*

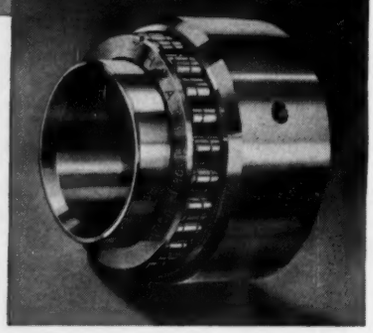












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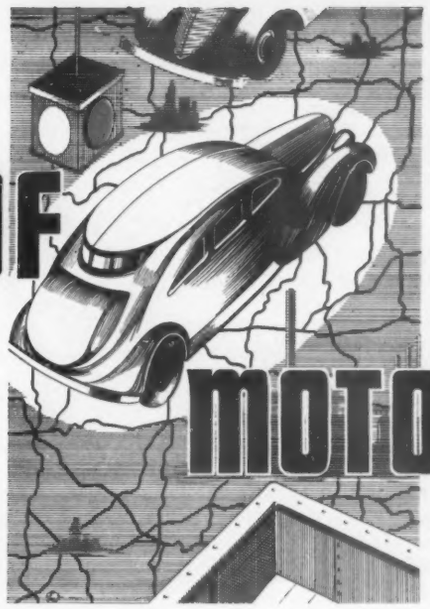
Just as we have successfully taken care of the bearing requirements of Jones & Laughlin and all the other leading steel mills, for over twenty years, we are ready to serve you. Call on us.

Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey. Hyatt Roller Bearing Sales Company, Chicago and Pittsburgh.

MIRRORS OF MOTORDOM



BY A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ IN NO uncertain terms General Motors last week served notice of its broadened invasion of the diesel engine field. Sales and manufacturing facilities for diesels, from 22 to 1200 horsepower in size, are being completely reorganized. A spacious new manufacturing plant and development laboratory here were thrown open for inspection for the first time last Wednesday. Within the next month or two another plant, for larger engines, will be in operation at La Grange, Ill. The Winton division in Cleveland, now building locomotive and marine diesels, will discard the Winton name and become the focal point for assembly and distribution of diesel "power packages," the term applied to the combination of engine and installation accessories such as foundations, mufflers, fuel supply system and the like.

Four Engine Sizes

The Detroit plant (see p. 38) will build four sizes of engines around one basic cylinder size and design. The units will be known as the 71 series, referring to the 71 cubic inch displacement per cylinder. A larger series of engines will be built in the new La Grange plant of Electro-Motive Corp., these based on 503 cubic inch displacement per cylinder, while the Cleveland division will build units in intermediate sizes with 223 cubic inch displacement per cylinder.

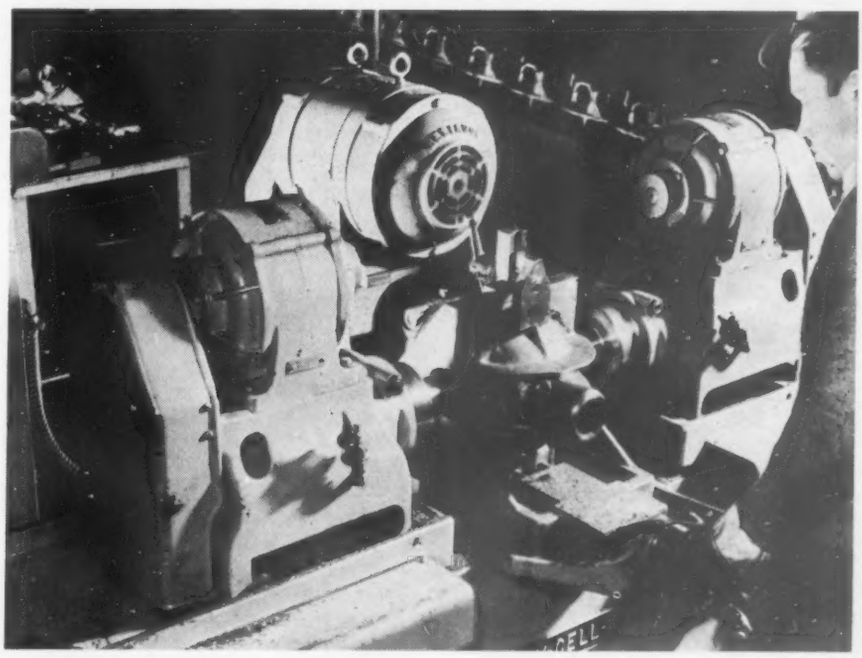
Inspection of the new diesel division here reveals it to be truly a "dream" plant. Set in a densely wooded section about 11 miles from the heart of the city, and adjoining the Pere Marquette railroad, the plant has every modern innovation in design and equipment. Walls are over 40 per cent glassed, machinery is practically all new and spaced with wide aisles and ample room for operators. Power is carried through the plant in enclosed steel duct systems, with conduits leading down to each machine.

The diesel development laboratory, which incidentally will house all GM diesel research and test activities, is separate from the plant. Separate acoustically treated bays are provided for all types of engine tests, one engine per bay. Exhaust from the engines is muffled in concrete stacks. Windows in the test bays are of translucent glass block.

Output of the Detroit division is set now at 50 engines per day, and completed units will be coming from the assembly line within the next two weeks.

The new diesel line is featured by interchangeability of component parts, accurate balancing of mov-

Three Boring Operations Finished Simultaneously



■ **Three-way boring machine built by Ex-Cell-O Corp., Detroit, finishes simultaneously the cross bores and pinion bore in the differential carrier case for Pontiac rear axles. Carrier is located from two drilled and reamed bolt holes, and by performing the three boring operations in one setup, chances for misalignment are avoided. Cutting tools are tipped with tungsten carbide. Each bearing hole is inspected with a Swedish gage reading to 0.0001-inch, with a specified tolerance of 0.001-inch. Production is completely automatic at a rate of 60 carriers an hour**

ing parts, and precision manufacture of such parts as injectors and blowers. Injectors are the heart of the diesel engine and require all the craftsmanship of a jeweler in their manufacture—one reason, by the way, for the high cost of these engines. Injector bodies and plungers are of silchrome steel, the highest grade in the General Motors classification of steels. The design calls for unit-type injectors, one per cylinder.

All this flurry in the diesel field should not be construed as indicating the day of the diesel engine for passenger cars is at hand or even within sight. It is definitely not. Diesels are aptly suited for trucks and buses on long, heavy-duty hauls, and for many marine and stationary engine installations for power supply, but they cannot compete with gasoline engines for passenger cars.

One of the major difficulties with diesels has been the matter of starting, especially in colder weather. General Motors engineers say their new units will start readily down to about 30 degrees, but below that point, they have found the best way to start them is to apply the flame of a blowtorch to the blower housing to heat the air which scavenges cylinders and supplies oxygen for the explosive mixture. The new engines are built on the two-cycle principle which, contrasted with the four-cycle automotive engine, provides twice as many power impulses per cylinder and permits reduction in the weight per horsepower of the engine.

Eyeing the strides GM is making in the diesel field, Chrysler engineers have not been idle, and it is understood Chrysler shortly will announce a new series of diesel truck engines.

■ ASSEMBLY schedules in general have shown no sharp upward revisions and in fact may show some tapering the last half of this month. Plymouth, for example, operated four days last week, will continue four days this week, closing Jan. 28 until Feb. 8.

Hudson is the exception so far as assemblies are concerned, output advancing steadily toward weekly day shift capacity of 3200, as stocks of the new 112 model are being distributed to the many new outlets for Hudson which have been signed up in recent weeks.

Ford assemblies are continuing at a rate of better than 20,000 weekly. This figure may be changed somewhat shortly if the company takes anticipated steps toward closing the wide margin by which deluxe models are outselling the standard line. In some sections the ratio of deluxe to standard sales has been as high as 9 to 1, indicating a surprising public preference for the higher cost and embellishments of the deluxe series.

Well-authenticated reports of another new car in the low-price field are heard. This will not be offered by any one of the big three companies, and examination of the list of independents who might be sponsoring such a model narrows them down to Studebaker or Nash. The former plant closed down on assemblies at the turn of the year and until last week no cars were coming from lines at South Bend. A new, smaller car from this builder would not appear beyond the bounds of possibility.

Nash assemblies have been running at a rate of about 700 per week, or one-third the rate of a year ago. In view of this situation and in view of the company's strong cash position, a venture into the low-price field might prove an interesting experiment.

Cadillac is turning out about 200 cars weekly, mostly of the recently announced lower-priced series. Buick is on a four-day week schedule, 6 hours per day, output approximately 3300 per week. Chevrolet is assembling about 15,000 per week on the same basis. Pontiac is moving some 1300 units weekly.

Buick, incidentally, re-entered the steel market last week, releasing commitments for about 6000 tons of material for use over the balance of the first quarter. The business, the first important steel purchase since Oct. 1 by Buick, was divided among midwestern mills and Wall street observers claimed steel stocks moved up fractionally with the announcement, indicating how anxious traders are for encouraging news. Buick schedules call for about 14,000 assemblies this month, the same number in February, and a sharp increase in March.

A strange aspect of the Chrysler picture, week before last, was Dodge taking the lead from Plymouth in assemblies, turning out about 5700 units against 5500 for Plymouth. In normal weeks, Plymouth will assemble probably twice as many cars as Dodge. Chrysler and DeSoto weekly production averages about 1300 or 1400 each.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,909
Aug.	245,075	275,934	405,064
Sept.	92,728	139,820	175,620
Oct.	280,316	230,049	337,979
Nov.	408,550	405,799	376,637
11 mos.	3,701,494	4,097,316	4,669,629
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended	
Dec. 25	67,230
Jan. 1	49,550
Jan. 8	54,084
Jan. 15	65,735
Jan. 22	65,418

	Week ended Jan. 22	Jan. 15
General Motors	21,920	22,160
Chrysler	11,800	13,975
Ford	22,765	22,765
All others	8,933	6,835

■ AS AN indication of how far along some 1939 designs are at the moment, it is interesting to note that at least one body builder here is taking shipment of certain parts for use in body assembly, parts which would indicate an important departure from present body construction. It is rather unusual to find work on new models so far advanced at this date, but it is possible that the volume producers are fortifying themselves against any sudden success which a new design might meet from the public. If there is a solution to breaking the present logjam in new cars, rest assured no aggressive manufacturer is going to be caught napping.

Opinions of 42 state commissioners of motor vehicles expressed here at the recent S. A. E. meeting were studied carefully by car builders, as a gage of public opinion on motor cars. One salient observation, concurred in by 26 of the commissioners, was that present frontal structures of cars are too high and that in the interest of safety engines should be placed in the rear. It is quite likely someone will make the step toward rear engines in next year's models, although a host of engineering problems remain to be ironed out before such a switch becomes feasible.

■ COMPLETE change in attitude appears to have developed in the ranks of the United Automobile Workers, and the militancy of a year ago has disappeared. For example, when Gar Wood Industries Inc. here recently announced the necessity of reductions in wage rates ranging from 5 to 20 per cent to meet the competitive situation in Detroit, the UAW, through its president, Homer Martin, indicated it would co-operate with the company. Faced with the alternatives of accepting wage reductions or seeing their jobs go outside Detroit, employes voted in favor of the former plan.

WINDOWS OF WASHINGTON

BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ PRESIDENT ROOSEVELT last week disclosed he is working with various industrial and labor leaders toward establishment of a new but simple national policy machinery which will represent all elements affected by legislative and administration policy. This definition of purpose was made at a conference with the commerce department's business advisory council.

At the same time the advisory council gave the President a statement pledging co-operation with his aims, but asking modification of some policies and clarification of administration aims that the country may know what direction reform is likely to take.

General approval to the advisory council's position was voiced by the President. The Chief Executive revised his attitude as to abolition of all holding companies and suggested listing and reporting of expenses by labor organizations.

Rapprochement Seems Nearer

This conference, followed by publication from the White House of the council's statement, indicated a nearer approach to a meeting of minds than any other development to date in negotiations between business, which distrusts the administration, and the administration, which repeatedly has assailed business.

Recommended by the council were re-examination of wage and hour legislation, amendment of the Wagner labor act to establish responsibility where there is privilege, substantial modification of the undistributed profits and capital gains taxes.

Further cheapening of the dollar and pump priming would seriously interfere with, if not completely prevent, the resumption of fundamentally sound recovery.

Use of holding companies for financial manipulations and undesirable extension of control in the hands of a few people was decried by the council.

"On the other hand, we view with grave concern any general move to outlaw proper holding companies. . . or to interfere with operations of the mass production industries, the economic benefits of which have been so clearly recognized by the people of this country and have been the envy of the civilized world."

Avowing pyramiding of and abuses by holding companies in the public utility field should be eliminated, the council at the same time said it was "disturbed" by the situation existing between the administration and the public utility industry.

The administration was urged to apply its policies in a manner not to cripple industry and to release a flow of private capital to new enterprise.

Co-operation in developing legislation to prevent monopolistic practices and revising outmoded antitrust laws was pledged.

Indorsement of the President's expressed aims for agriculture, railroads, housing, annual wages and social security (with amendments) was given.

PLEDGE OF CO-OPERATION GIVEN BY MANUFACTURERS

William B. Warner, president of the National Association of Manufacturers, sent a telegram to the President last week offering the co-operation of the association in an effort to see what can be done about the business situation.

Charles R. Hook, president of the American Rolling Mill Co., is chairman of a new committee of the association, called the "committee on national policy co-ordination and co-operation." In notifying the President of the appointment of this committee, Mr. Warner called attention to the fact that the congress of American industry held in New York early in December adopted a platform for 1938 in which it "pledged its co-operation in furtherance of measures which will promote the best interests of the American people." In his wire to the Chief Executive Mr. Warner said: "We desire to be helpful to you in finding a sound solution to the many problems which affect business recovery and employment problems, which we recognize affect every part of the national life. We pledge our sincere and best efforts to co-operate with and constructively assist such agency or agencies of government as you may indicate as the person or persons with whom you would like us to work."

FEDERAL LICENSE BILL EXERTS MANY CONTROLS

Business leaders apparently are not as wide awake in connection with the O'Mahoney licensing bill for industry as they should be. As has been pointed out in this column a number of times since its introduction, this bill confers on the federal government large powers over the affairs of all interstate corporations.

Among other things, the O'Mahoney bill would require corporations doing an interstate business to have a federal license. To obtain and retain its license a corporation would be required to observe certain specified labor and fair trade conditions. Among some of the major requirements, the bill provides that a corporation would not discriminate in wages paid to male and female labor for work of substantially equivalent character. It could

not employ minors under 16 years of age.

It is provided also by the bill that a corporation must recognize the right of labor to bargain collectively, could not acquire stock of any other corporation and could not pay a bonus or commission to any officer except by vote of the stockholders.

The bill provides further that the corporation would have to distribute to stockholders and employes corporate surpluses exceeding an amount as yet unspecified. Among some of the other provisions, the bill would require the federal trade commission to summon a national industrial conference of employers, employes and the investing public to develop a program for the coordination, stabilization and orderly development of basic industries. Furthermore, the commission would recommend to congress a minimum wage for the lowest paid class of unskilled labor whenever the commission might find abuses in the form of low wage scale.

TREASURY FAVORS SOME REVISION OF TAX LAWS

The ways and means committee of the house last week held hearings on suggestions which its subcommittee made for tax revision.

A number of business men appeared, urging more leniency toward industry. However, there is a general feeling that the ways and means committee will follow closely, if not exactly, the suggestions of the subcommittee.

This report was made after many weeks of study, under expert advice of statisticians of the treasury department.

Roswell Magill, undersecretary of the treasury, was the principal witness for the treasury. He has been working with the subcommittee continuously and is said to have been in hearty agreement with the recommendations for changing the tax system. Magill said that further extensive tax law revisions might be made at some later date. He said that additional revision might touch on such matters as personal tax exemptions, repeal of all temporary manufacturers' excise taxes, tightening of relationship between federal and state taxes, and fixing interest on future issues of federal, state and municipal securities.

NEED FOR BETTER NAVAL MACHINE TOOL EQUIPMENT

Assistant Secretary of the Navy Edison has made recommendations before a subcommittee of the house committee on appropriations in connection with machine tool replacements in navy yards, according to information which is just available. The hearing was held in executive session, but when the navy bill was reported out last week the house committee made public the testimony.

"The program of machine tool replacement in industrial yards is being continued at a rate somewhat less than the recommendation of a special board convened for that purpose," Mr. Edison told the committee.

"A survey made in 1930," he said, "showed the average age of tools in the yards to be 19 years, which is considerably greater than good practice demands. To maintain the average age constant at 19 years would require an annual expenditure of $1,550,000, which would have included replacements and additions. The actual annual expenditures from 1930 through 1937 have averaged $1,195,000, as a result of which it appears that the average age is increased to something above 19 years rather than decreasing to the goal of 15 years, which was set as a desirable standard. The funds just mentioned are those appropriated to the bureaus of construction and repair and engineering."

"A reasonable standard appears to be to furnish machine tools so that only one shift is required in time of peace to provide for peacetime requirements," he added. "With this standard we would be prepared to more than double our production on a three-shift basis. At the present time, every yard has one or more shops which must work more than one shift under present peacetime demands. A recent survey shows that there now exists a need for some $16,000,000 worth of new tools. Budgetary requirements have, however, limited the amount requested for 1939 to $1,500,000, divided equally between engineering and construction and repair."

WAGE-HOUR BILL TO BE GIVEN MONTH'S DELAY

The house labor committee last week definitely decided to wait for a month or so before again bringing up the question of hours and wages legislation. The idea is, probably, to give congress time to quiet down again before bringing up this controversial subject. The President has several times let it be known in no uncertain way that he has no idea of letting this legislation die.

As the Walsh-Healey act would be virtually nullified in the event of the passage of a wage-hour bill generally applicable to all industries, there is probably more than usual significance in the sudden expansion of the activities of the public contracts board.

It has been pointed out in well informed circles that there would be little point in fixing minimum wages for a number of important industries that would be applicable only to the concerns taking government contracts, if the early passage of a general minimum wage statute were anticipated.

Last week the public contracts board held hearings on prospective minimum wages for millers taking government contracts subject to the act. This is the first major industry outside the apparel industries for which the board has undertaken to apply minimum wages. It is understood that other hearings will also be announced shortly for other major industries.

TO HEAR METAL EXPERTS IN INQUIRY ON EXPORTS

A meeting of the subcommittee of the senate military affairs committee is to be held soon to hear from government metal experts on critical and strategical raw materials.

As nearly as can be learned what the committee means by this phrase is tin, manganese, chromium and certain other minor metals.

The date for such hearings has not been set. The hearings are to be held in connection with the investigation of bills prohibiting exports of iron and steel scrap, except under license.

When this matter finally comes to hearing the same subcommittee will have charge of the matter as during the first session and in includes Senators Thomas, Utah, chairman; Johnson, California; Schwartz, Wyoming; Bridges, New Hampshire; and Lodge, Massachusetts.

The subcommittee has already notified some of the key government departments to have experts ready when the subcommittee is ready to call them. Among the departments which have been notified are: interior, commerce, army, navy, state, tariff commission, and several others. The first hearings, in accordance with the present plans, will not take up iron and steel scrap, but various metals and they will be in executive session.

HASTEN RATE DECISION

Definite announcement was made last week by the interstate commerce commission that it will begin hearing final argument in the 15 per cent freight rate increase case Jan. 31.

There is a general feeling here that only four or five days at the most will be taken up by the argument, which means that early in February the case will be pending for final decision. The railroads are hopeful of getting a quick decision, which means the latter part of February or early in March.

Road Building, Steel Industries Closely Knit; Federal Highway Aid Essential to Recovery

■ Some 28,000 visitors attended the road show last week. Cleveland's great public auditorium was a veritable forest of metal assemblies. Tractors, diesel and gasoline engines, air compressors, pumps, concrete mixers, harrows, scrapers, road planers, bulldozers, rippers, shovels, derricks, motor trucks, trailers, dump wagons, draglines, cranes, hoists, graders, vibrators, pile drivers, asphalt plants, spray trucks, drills, pneumatic tools of various types, crushing and screening plants, buckets, tar kettles, spreaders, road rollers, conveyors, excavators and snow plows were among the mechanical units shown.

Road Equipment Provides Huge Market for Many Steel Products

The exhibits dramatized the place of the highway construction industry as a huge market for forgings, castings, power control units, antifriction bearings, lubrication systems, springs, oil seals, transmissions, hydraulic and air operating mechanisms, wire rope, concrete reinforcing steel, road and curb forms, structural steel, sheet piling, expansion joints, road signs and a host of other products.

STEEL's statistics on steel distribution showed that 499,592 tons were consumed by the road building industry in 1936. The road show disclosed where this large tonnage goes. It revealed that this industry constantly is becoming a more desirable customer.

An impressive feature was the greatly increased capacity of various road building units. This has been brought about by adoption of the new high yield strength steels and by increased efficiency of diesel and gasoline power units. More alloy steels are being used and there is more hard facing. More parts are specified as forgings. More steel is used in expansion joints, curbs, sheet piling and temporary asphalt plants.

Of vital interest to the metal producing and metalworking industries, therefore, is the fact that the road builders convened with a feeling of uncertainty. This was because of threatened termination of federal aid and the administration's warning that federal highway funds allocated for the fiscal year ending June 30, 1939, should not be considered as obligated. In the event such aid should be discontinued road builders fear also that diversion of gasoline and other taxes earmarked for road construction would be increased beyond the present $200,000,000 rate.

Federal aid now is at the rate of $214,000,000 per year, matched dollar for dollar by state expenditures. Road builders do not believe federal aid will be discontinued. What they fear is that present postponement of such aid will discourage the present trend toward economic recovery.

Highway Dollar Tripled in Activity Dependent on Construction

Some interesting statistics were revealed at the meeting. Considering road building cost as well as the cost of producing highway materials and equipment, $910 out of $1000 spent on highways goes directly to labor. Each dollar spent on highways results immediately in the transaction of business involving $3.15. Some 6,000,000 citizens are dependent on highway transportation for their subsistence.

With a continuance of unemployment relief essential at this time, it is clear that there is no excuse for failure to obligate promptly the federal road building funds specified in existing legislation.

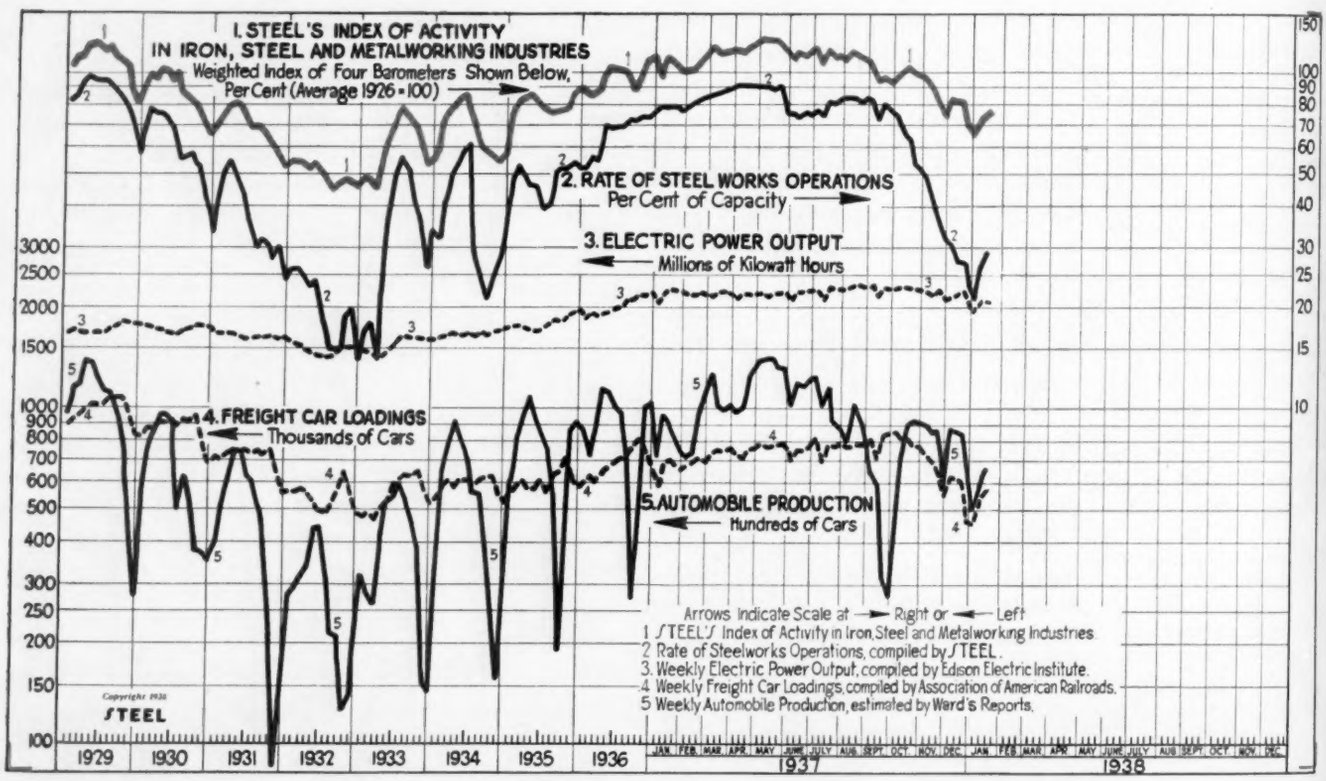
THE BUSINESS TREND

Rate of Improvement in Business Still Moderate

■ INDUSTRY'S progress toward recovery continues slow and tentative. Slight gains were registered in the week ending Jan. 15 in freight car loadings, automobile output and steelworks operations. Electric power output suffered a mild setback.

The net result of the fluctuations of these four barometers upon STEEL's index of industrial activity was a gain from 70.1 in the week ending Jan. 8 to 74.3 in the week ending Jan. 15. The recovery since the low point of the year-end holiday period has not been sufficient, as yet, to compensate for the losses dating from the week ending Dec. 18. Further moderate gains are indicated throughout January. The rate of steelworks operations continues upward, but at a not too encouraging pace. The automobile situation is slightly better. Railroad freight traffic is increasing at a painfully slow rate.

Notwithstanding the disappointing degree of improvement, corrective influences are taking hold more positively. New orders for automotive steel for first quarter delivery connote a wholesome reduction in consumers' stocks.


1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926 - 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3. Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938
STEEL
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938

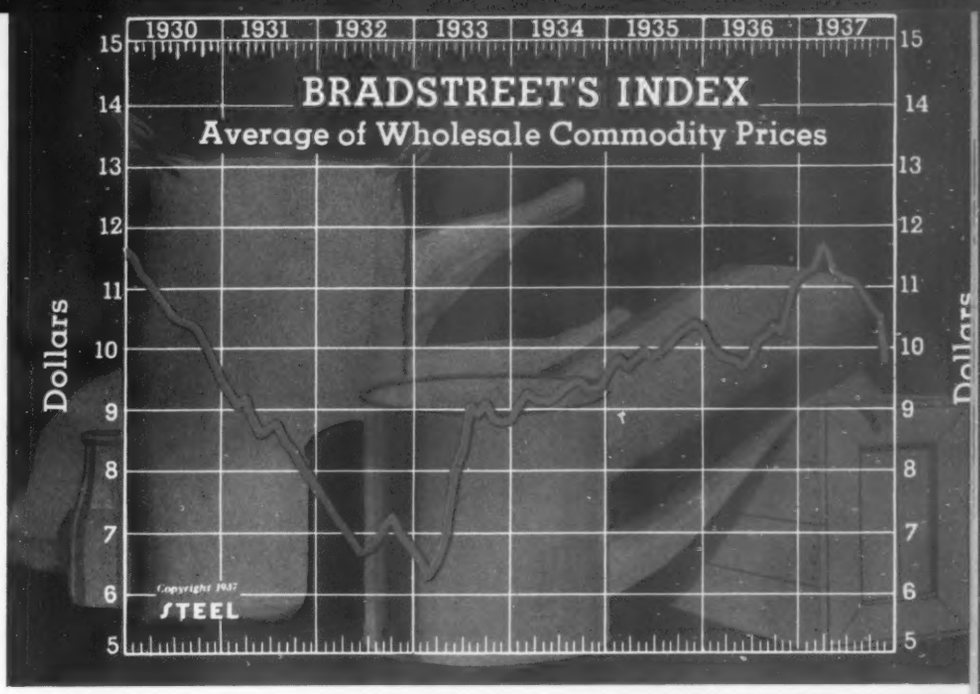
STEEL's index of activity gained 4.2 points to 74.3 in the week ending Jan. 15:

Week ending	STEEL'S index of activity index No. 1937	1936	Steelworks operating rate per cent 1937	1936	Electric power output million KWH 1937	1936	Freight car loadings 1937	1936	Weekly auto output 1937	1936
Oct. 16	101.8	95.5	63.0	75.0	2,276	2,170	809,944	826,155	89,680	48,195
Oct. 23	97.5	97.1	53.0	73.0	2,281	2,166	773,353	815,972	91,905	59,740
Oct. 30	95.7	99.1	51.0	73.0	2,254	2,175	771,655	814,175	90,155	66,985
Nov. 6	92.3	102.1	47.0	73.0	2,202	2,169	732,145	759,318	89,770	84,305
Nov. 13	86.5	107.9	39.0	74.0	2,176	2,169	689,614	784,672	85,325	104,248
Nov. 20	84.9	109.9	35.0	74.5	2,224	2,196	647,251	790,500	85,757	110,160
Nov. 27	72.7	105.2	31.5	75.5	2,065	2,133	558,627	679,984	58,955	104,283
Dec. 4	81.5	108.4	30.5	76.5	2,152	2,243	623,337	744,957	86,173	100,395
Dec. 11	80.5	113.9	27.0	77.5	2,196	2,278	622,131	738,747	85,765	119,455
Dec. 18	79.4	114.8	27.0	79.5	2,202	2,274	603,292	729,696	82,025	121,038
Dec. 25	69.5	93.3	23.0	68.0	2,085	2,080	460,367	562,218	67,230	79,019
	1938	**1937**	**1938**	**1937**	**1938**	**1937**	**1938**	**1937**	**1938**	**1937**
Jan. 1	62.7	96.6	21.0	79 0	1,998	2,069	457,359	587,953	49,550	71,800
Jan. 8	70.1†	107.8	26.0	79.5	2,139	2,244	552,314	689,529	54,084	96,780
Jan. 15	74.3*	106.7	29.0	79.0	2,115	2,284	574,406*	700,238	65,735	91,685

*Preliminary. †Revised.

Commodity Price Index Shows Further Decline on Dec. 1

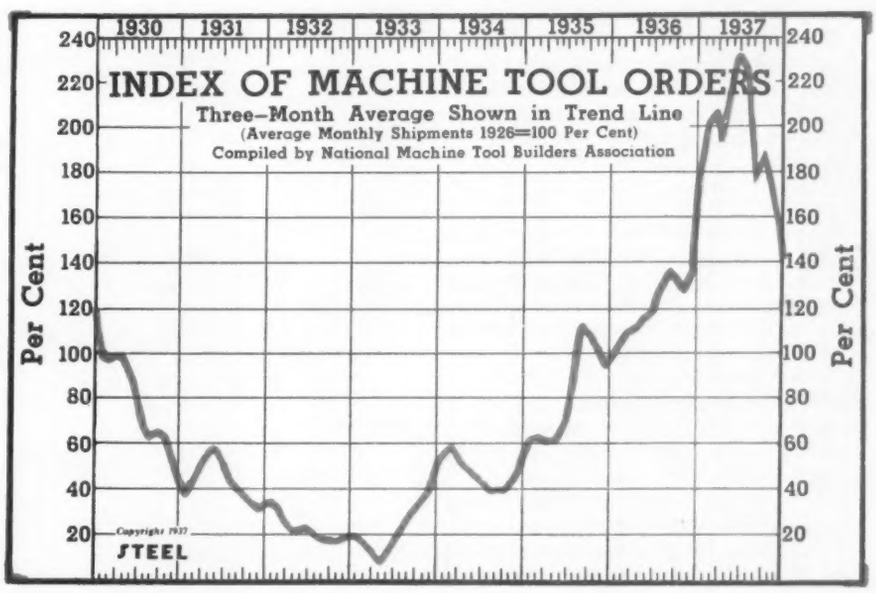
	1937	1936	1935	1934
Jan. 1.....	$11.13	$10.36	$9.49	$9.01
Feb. 1.....	11.23	10.02	9.78	9.26
Mar. 1.....	11.34	9.92	9.79	9.17
Apr. 1.....	11.81	9.85	9.66	9.16
May 1.....	11.51	9.81	9.79	9.14
June 1.....	11.33	9.73	9.90	9.24
July 1.....	11.27	9.85	9.84	9.32
Aug. 1.....	11.19	10.14	9.91	8.48
Sept. 1.....	10.96	10.19	10.00	9.45
Oct. 1.....	10.85	10.27	10.17	9.27
Nov. 1.....	10.35	10.22	10.28	9.29
Dec. 1	9.77	10.78	10.40	9.49



Machine Tool Index Down 22.7 Per Cent in December

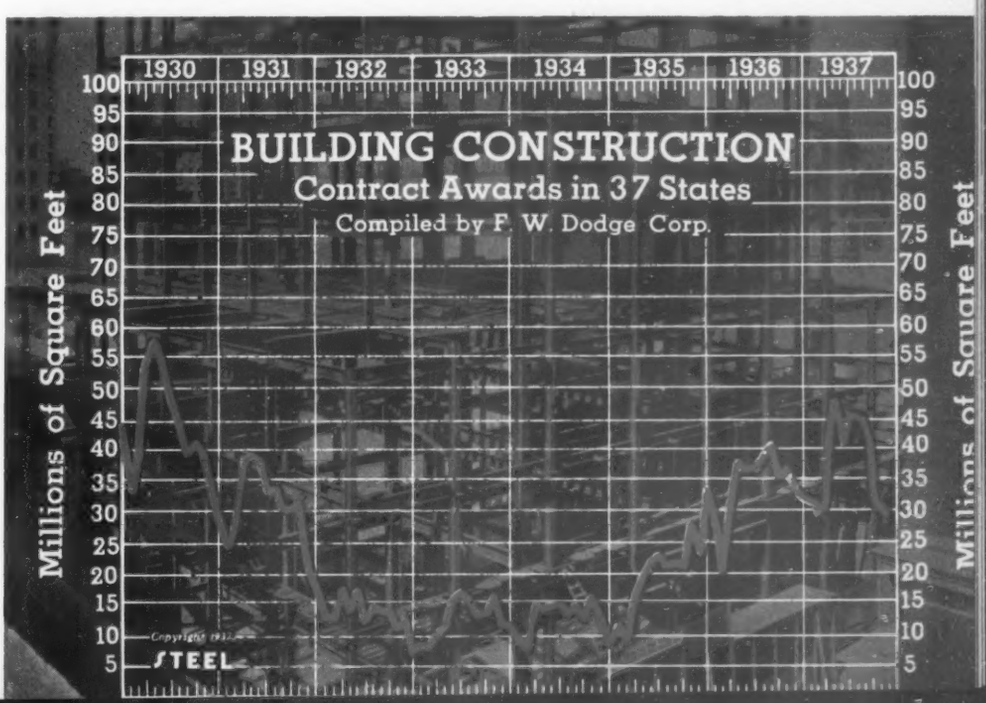
Three-Month Average

	1937	1936	1935	1934
Jan.....	201.7	102.6	61.3	56.5
Feb.....	207.7	107.1	61.5	58.2
March....	192.4	109.4	60.3	50.9
April	219.8	114.4	60.3	48.5
May.....	234.2	116.6	67.1	46.8
June	227.6	124.5	76.7	42.6
July	190.5	132.6	94.7	38.6
Aug.	180.9	135.5	112.2	37.1
Sept.....	187.2	132.0	108.5	37.4
Oct.	180.8	127.5	102.9	40.5
Nov.....	163.5	134.0	93.8	44.2
Dec	140.8	180.4	89.9	54.1

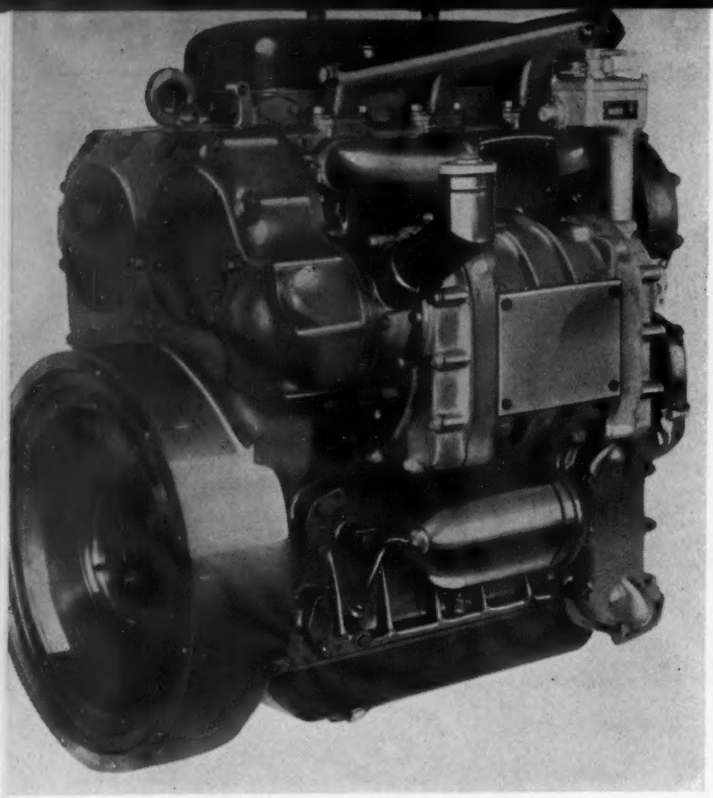


November Building Awards Shows Moderate Decline

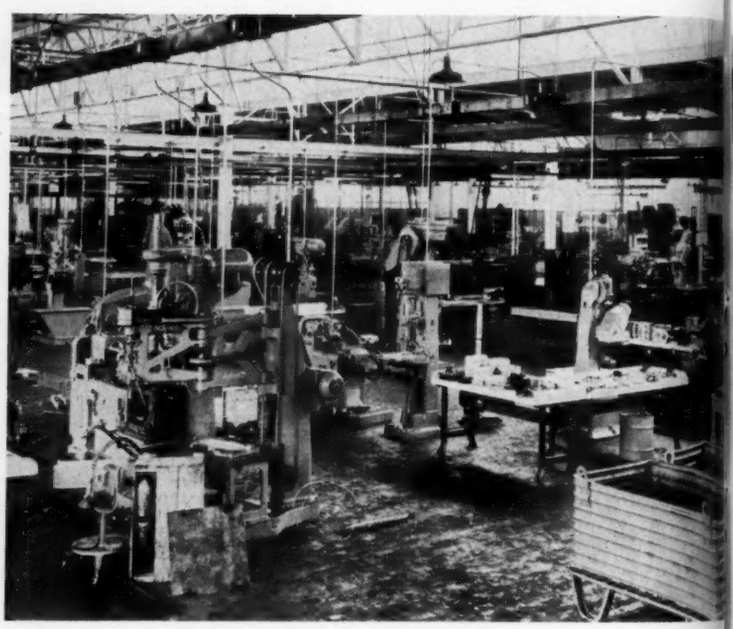
	Square Feet		
	1937	1936	1935
Jan....	33,470,000	27,053,300	11,245,100
Feb....	29,942,100	20,856,700	9,670,300
Mar.	41,567,800	31,257,900	15,845,300
Apr....	48,396,100	37,490,200	19,917,300
May...	40,287,900	36,362,100	22,276,200
June .	46,393,100	36,883,900	22,878,000
July...	45,812,600	38,762,500	21,565,900
Aug...	42,077,100	40,285,100	21,545,400
Sept...	32,364,300	35,448,000	21,365,700
Oct...	30,266,100	36,718,900	27,775,900
Nov. .	29,336,900	34,947,500	24,120,700
Dec....		33,632,600	33,441,900



The Small Diesel i



Typical of the new series of General Motors diesels is this three-cylinder two-cycle model, rated at 45 continuous horsepower at 1200 revolutions per minute



Overall view of manufacturing area devoted to production of one, three, four and six-cylinder diesel engines. Interchangeability of engine parts permits maximum use of production facilities

■ MASS production for the first time of small, light-weight, two-cycle diesel engines was announced last week by General Motors Corp., Detroit, coincident with the formal opening of the corporation's new Detroit Diesel Engine division plant and engineering laboratory. Also contained in the announcement was the plan for consolidating all of the company's diesel activities.

Until now, General Motors has limited its diesel activities to the building of larger two-cycle engines of from 600 to 1200 horsepower in the plant of its subsidiary, the Winton Engine Mfg. Co., Cleveland. The latter company now is to become the Cleveland Diesel Engine division, a change which marks the passing of the well-known name of Winton from the automotive and engine field.

Designated "Packaged Power"

A feature of last week's announcement was that the corporation plans to produce "packaged power" units, comprising the small-model diesels and generators, in either stationary or portable models, which can be set up quickly to power small industrial operations, theaters, hospitals, irrigation projects, and the like.

As a result of the General Motors expansion of diesel development, the new Detroit plant will build engines from 22 to 160 horsepower, the Cleveland division will manufacture units from 200 to 400 horsepower, and a new Electro-Motive Corp. plant to be opened within a few months at LaGrange, Ill., will turn out the larger engines. The new engineering and testing laboratory comprising a part of the Detroit plant is said to be the largest and most completely equipped in the world for exclusive diesel study.

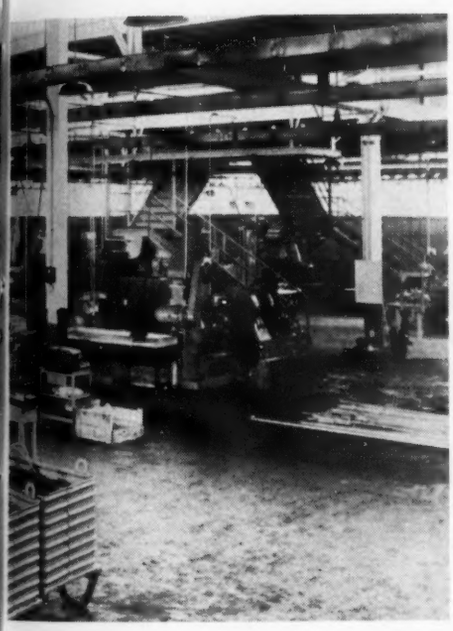
Headquarters of the diesel engine division of General Motors Sales Corp. will be in Cleveland. A complete national distribution system is being built up; service and parts organization will center around present facilities of General Motors Parts Corp. R. K. Evans is General Motors vice president in charge of diesel development.

Assembly of all types of diesel into the previously mentioned "packaged power" units will be done at Cleveland. This involves working out the necessary appurtenances for engine installations such as special foundations, fuel supply systems, water cooling arrangements and muffling equipment. In the case of the stationary electric power plant, for example, the package will include the engine, generator, fuel supply equipment, switchboard, radiator or heat exchanger, base and incidental equipment.

Dates for the inauguration of the new production programs at Cleveland and LaGrange will be announced later. Meanwhile the present activity at Cleveland on rail-

Mass Production

General Motors builds Detroit plant to produce 50 engines per day in range of 22 to 160 horsepower. Parts are interchangeable in all models and held to extreme accuracy. Facilities for intensive diesel research provided



road and marine installations is not affected. Employment needs at all three plants have been provided for.

The Detroit plant is located on a 75-acre tract of land on East Outer drive, with the first unit laid out for production of 50 engines per 8-hour day. The plant proper consists of a monitor-type structure, 240 feet in width and 480 feet in length. Maximum window glass area, high ceilings, spacious work places and aisles, and modern paint treatment all contribute to good working conditions.

Traversing the plant in its length, one finds the largest area is devoted to machine lines for producing major parts of the engine. Next is the experimental machine shop in which are built experimental engines for future development. Finally at the far end of the building is the injector department which manufactures and tests all fuel injectors used on all G. M. diesels.

Adjacent to the machine shop is the engine assembly line, at right angles to machine lines; adjoining is the final test department where all engines are subjected to dynamometer testing before shipment. Electrical equipment is arranged to absorb the power of the engines on test, and to transmit it in the form of electrical energy to the main power plant.

Precision operations are keynoted in the machine shop. Here are found modern precision boring machines, diamond-boring machines, centerless grinders, honing machines and similar equipment associated with precision manufacture.

One of the most important of the precision operations is that of producing piston and connecting rod assemblies. In most cases of automotive engine production, these assemblies are permitted to vary between fixed limits and then are assembled into balanced sets by selective matching of pistons and rods. At the Detroit diesel plant, each of the parts is interchangeable as to size and weight with its fellows and each assembly conforms to the same weight specification. This is achieved by the use of machines which automatically weigh the piston or the rod and machine it precisely to the weight required.

Connecting rods not only are precision bored to achieve the desired control of size and roundness but also are subsequently honed to produce the desired surface finish.

Interchangeability of the various engine models finds its best expression in the machine lines for the large units such as cylinder blocks and heads. Cylinder blocks and heads are designed so as to be geometrically similar for all sizes and end-for-end. The ends of all blocks whether they have one, three, four, or six-cylinder barrels, are precisely alike; and the drilling of the top and bottom is the same save for the fact a larger block will have more holes. This basic conception of design makes it possible to use but one line of special machines for the entire range of engines no matter what number of cylinders.

Boring Extremely Accurate

Chief feature of the blower department is the simplicity of equipment and process for an operation so intricate and precise. For example, the aluminum blower housing has two bores which must be finished to accurate limits. This is done by boring the housing on a single-end precision boring machine. As one bore is rough finished, the table indexes the work forward, hydraulically, to complete its mate. Subsequently, each hous-

Hydraulically - controlled precision boring equipment for boring the aluminum blower housing of a small diesel engine performs this exacting task in 6 minutes

Production and experimental models of fuel injectors are tested in this equipment. Operated by an electrically driven camshaft, plungers of the four injectors shown are being moved through 3,000,000 cycles per day to discover weaknesses in design or construction

ing is processed in the same machine for a second and final boring operation.

The blower rotor is a three-lobed affair, each lobe having a spiral form along its axis. One specially designed machine set-up handles this operation automatically. It takes three separate settings of the rotor to complete the job, using a specially formed cutter which encompasses a third of the profile each time. As the cutter traverses the face of the rotor, the rotor casting is automatically turned by an indexing mechanism to produce the spiral form.

Other innovations include electric induction equipment for heating flywheel ring gears. Crankshafts are checked 100 per cent for static and dynamic balance using a standard balancing machine, also used for balancing flywheels.

The plant also has a modern and well-equipped heat treating department together with a metallurgical laboratory.

A precision manufacturing department has been set up to produce fuel injectors. In its present form it represents the objective of translating the skill of the instrument maker into mechanized operation.

One may gain a good picture of what has been accomplished by considering a few of the measurements made mechanically. Consider that the maximum clearance between the barrel or bore of the injector and the plunger which moves within it must not exceed 50 millionths (0.000050) of an inch! Consider further that at the tip end of the injector, the maximum clearance between the needle valve and the bore within which it seats must be less than one ten-thousandth (0.0001) of an inch.

Injector parts are measured by an Electrolimit gage, accurate to the millionth part of an inch.

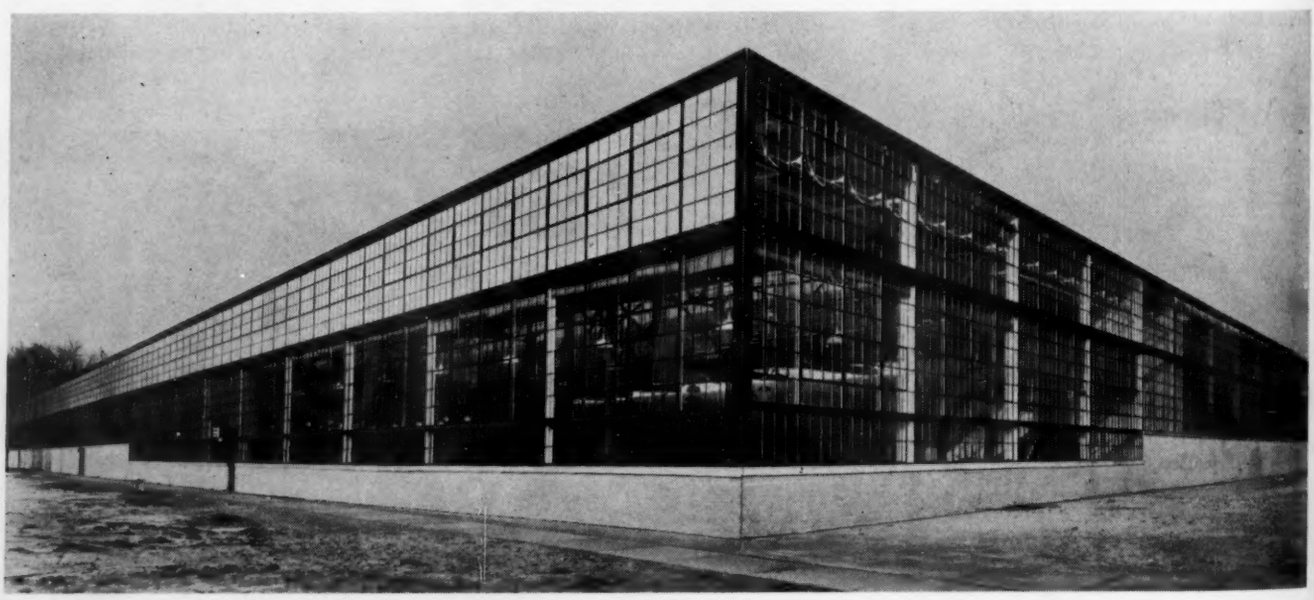
Another problem was the drilling of spray nozzle holes. These holes are small, and in addition to having accurate sizing must be drilled at correct angles with precise spacing. The holes are of various diameters depending upon the size of the engine, the general range in diameter lying between 0.006 and 0.014-inch. Drilling is done by means of small drilling machines in which the drill is rotated at extremely high speeds by means of an air-operated turbine. The drills are so sensitive to pressure that they cannot be fed into the work by mechanical means; the drill spindle floats and is pressed into the work by the operator's finger as the drill rotates.

All of the internal parts and bushings are lapped to provide the desired finish and polish. While this is a hand operation, it is facilitated by the development of a battery of special lapping machines both for internal and external work.

Testing the Injectors

The final step is the test department in which each injector is tested individually and calibrated according to specifications. Here will be found a testing machine with a universal fixture for handling all types of injectors; two other test machines for large injectors; and two multiple-head testing machines; for small injectors. The latter units test ten injectors in each machine. The entire battery is served by a central unit which circulates filtered oil and lubricant to all machines.

All precision grinding operations on injector elements are performed in a centralized grinding department, located in the precision machining department but completely isolated from it. This is done for two reasons. First, it keeps the precision grinding department clean and free of any dust or dirt; second, it protects the precise drilling and lapping operations in the other department from the fine dust and grit that may originate from the grinding wheels.



The new Detroit diesel engine division of General Motors Corp. is housed in a plant measuring 480 x 240 feet, providing 115,000 square feet of working space. Maximum window space affords an abundance of natural light

Flexible Design Provides Eight Diesel Models in Each Size

BY F. G. SHOEMAKER

Chief Engineer, Detroit Diesel Engine Division, General Motors Corp.

■ WHY have engineers been so slow in developing a diesel engine as light and small and low priced as a gasoline engine? One reason is the lack of volume production to reduce costs, but this is secondary. The greater fuel economy of the diesel engine is due to its much higher compression ratio and explosion pressure. Obviously these higher pressures require stronger cylinders, connecting rods, crankshafts, bearings and the like. Using the same materials and manufacturing methods as in commercial gasoline engines, and maintaining the same degree of reliability, this necessarily results in a larger and heavier engine unless the diesel engine principle permits making an engine of a fundamentally different type than a gasoline engine. Fortunately this is possible by making the diesel engine two-cycle.

Describes Two-Cycle Engine

A two-cycle diesel engine is simply a conventional four-cycle type gasoline engine structure, made stronger to withstand the higher explosion pressures, with the valves arranged to be open at the same time, and with a blower added to fill the cylinders and push out the exhaust gases. The additional power resulting from twice as many power impulses per cylinder more than offsets the added weight of the stronger parts and the blower, and thus places the two-cycle diesel engine on a direct competitive basis with gasoline engines as regards size, weight and power, with the added advantage of saving in fuel.

The two-cycle diesels developed by General Motors have much the same construction and appearance as conventional four-cycle gasoline and diesel engines. The cylinders are cast en bloc with removable dry liners. The cylinder head is a one-piece removable unit with overhead valves. The valves are operated through rocker arms and pushrods from a camshaft located in the upper part of the cylinder block. The camshaft is driven by a train of gears which also drives the blower. The water pump, fuel transfer pump and governor are mounted on the blower and driven by it. The oil pan and valve covers are one piece pressed steel units.

In order to function as a two-cycle uniflow engine the cylinders are made with inlet ports, through the liner and water jackets at the bottom stroke position, which connect the cylinder to the air box surrounding the cylinder proper when the ports are uncovered by the piston. The blower is flange mounted on the side of the cylinder block and discharges directly into the air box.

The fuel is sprayed into the cylinder by a combined pump and spray nozzle or unit injector located between the valves in the cylinder head and operated from the camshaft by a rocker arm, like the exhaust valves.

Couples Balanced Out

The only really new design feature of the engines is the provision for complete balancing. With the camshaft arranged to give uniform firing of all the cylinders each revolution, there results a small fore and aft rocking couple. This has been completely balanced out by small counterweights at each end of the camshaft, and a second similar shaft on the other side of the cylinder block. This device makes it possible to produce engines of 1, 2, 3, 4, 5, 6 or more cylinders, free from unbalanced forces or couples. This balancing system and the inherent symmetry of the two-cycle uniflow type of cylinder offers an entirely new approach to the problem of engine models covering a range of power requirements with various accessory arrangements and different direction of rotation.

The entire cylinder block and blower assembly can be turned end for end without turning the flywheel or gear train, and thus place all the accessories on the opposite side. In a similar manner the cylinder head can be reversed regardless of the position of the blower, and place the exhaust and water manifolds on either the opposite side or the same side as the blower. By shifting one gear in the gear train, and changing

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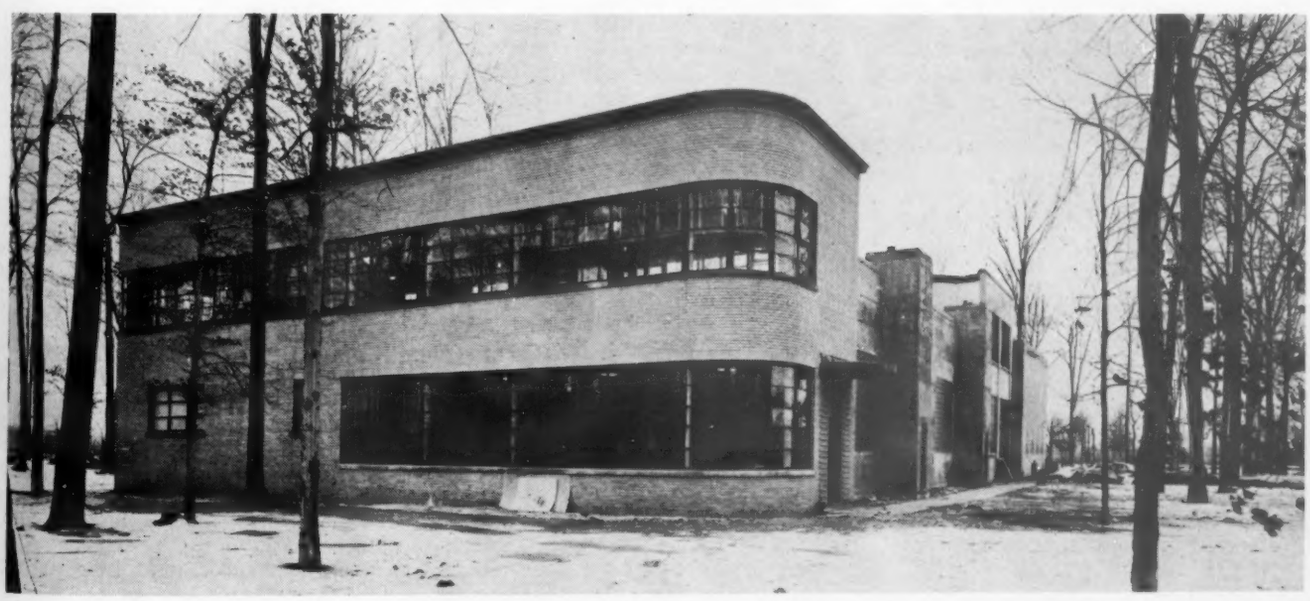
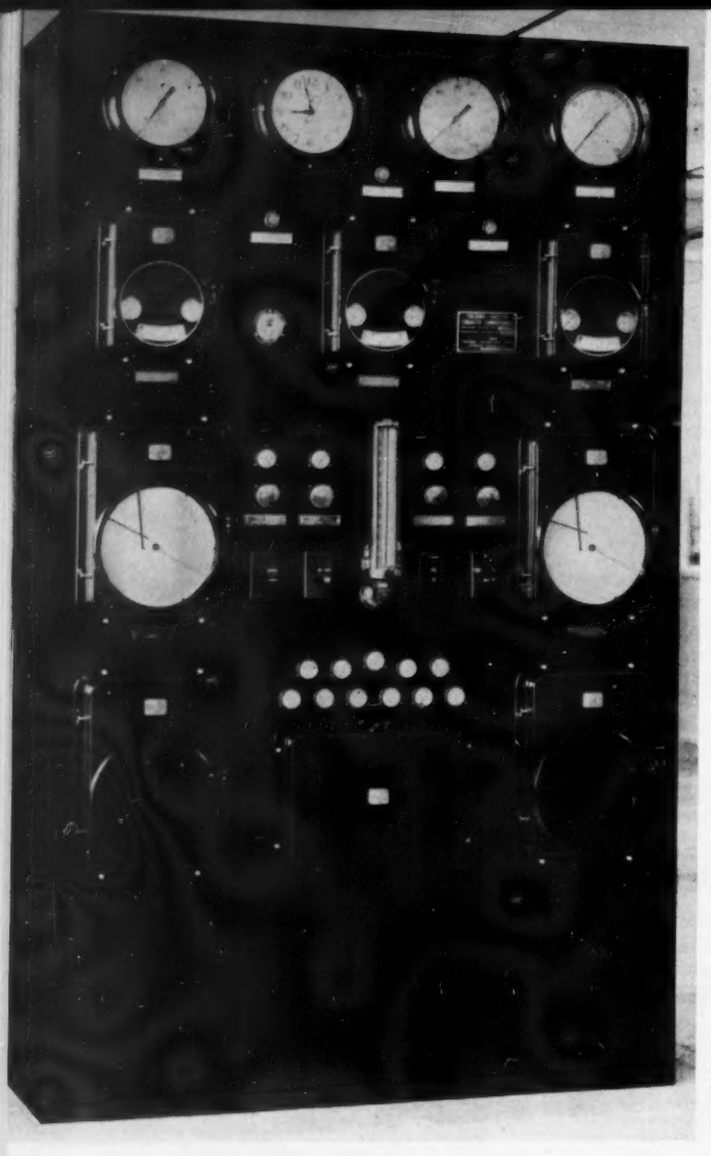


Noise and vibration of engines under test in this new 223 x 105-foot laboratory are said to be completely muffled by 75-foot concrete-steel piles, sound-proof walls and ceilings. Windows are of translucent glass brick

Co-ordinated Pr

By CHARLES WEBBER
Bristol Co., Waterbury, Conn.



This control equipment operates 40 valves from one to six times in 19 minutes according to a precise schedule — an operation which could not be performed manually

■ AN ORCHESTRA, leaderless, takes its position in the pit, picks up its instruments and begins to play at random. The result is a conglomeration of sounds and noises. The leader arrives, takes up his baton, and the sounds and noises, properly coordinated, become music harmonious to the ear.

Across the stage parades a robot operated by a mechanical brain. He sits down, stands up, uses gestures. Very little imagination would be needed to believe that the robot is human. But, the spectators take the whole performance practically for granted as just another step in the progress of this modern world.

Just as mysterious are hundreds of processes in industry today, little seen by the public, but generally taken as a matter of course.

All this is demonstrative of a new term looming up more importantly on the industrial horizon—co-ordinated process control. Constantly increasing competition for business and the resultant necessity for producing products, not only at less cost but of exactly uniform quality, has resulted in closer control of industrial processes as a further advance in the age of instrumentation.

In the maze of scientific development and in the active web of industrial pattern it becomes equally trite to an apathetic audience to say that little of the advancement which this generation has seen would be possible if it were not for modern instruments. For if steel, nonferrous metals, plastics and other materials are the vehicles for the products of this modern age then instruments are the eyes and ears—in short, the officers directing and circumscribing the product which has emerged.

Instrument control to a large extent removes the human element of chance in processes which constantly are growing more complex. No man or group of men can be depended upon to turn valves, push levers or start each phase of a process at precisely the right moment. Each deviation from the process as originally determined in the laboratory might result in a slight but little apparent variation in the finished product.

Buyers today demand products which are precisely identical to original samples. Often sales departments are blamed for increasing rejections and declining business but in many instances the difficulties may be traced back to slight deviations in formative processes. These difficulties often may be overcome by properly coordinated instruments.

Co-ordinated process control, in simple language, consists of a combination of instruments, made up of thermometer controllers, flow controllers, pressure controllers and such other instruments necessary in controlling a given process.

In addition to these instruments, a process-cycle, an operations controller, time-temperature, or time-pressure controller is necessary. Timing renders the control system different from just a panel board of instruments in that a given process is carried through to completion.

In designing a coordinated control system, each instrument is selected for its ability to perform a particular duty in cooperation with each of the other instruments in the system. The operations controller, consisting of a series of cams, synchronizes the operation of all the instruments and interlocks them into an integrated unit.

The control system, as a unit, is intended primarily for automatically operating industrial processes. It automatically controls all of the technical factors by controlling and manipulating valves, blowers, temperature, humidity, pressure, liquid levels, speed, etc., and thus eliminates the hazards of turning a care-

Process Control

Groups of instruments, tied in with cam-operated, process cycle controllers, now govern operations in many industries. Mistakes that occur with manual control are avoided. Co-ordinated control has many applications in the metal producing and metalworking industries

fully developed, intricate process over to plant operatives.

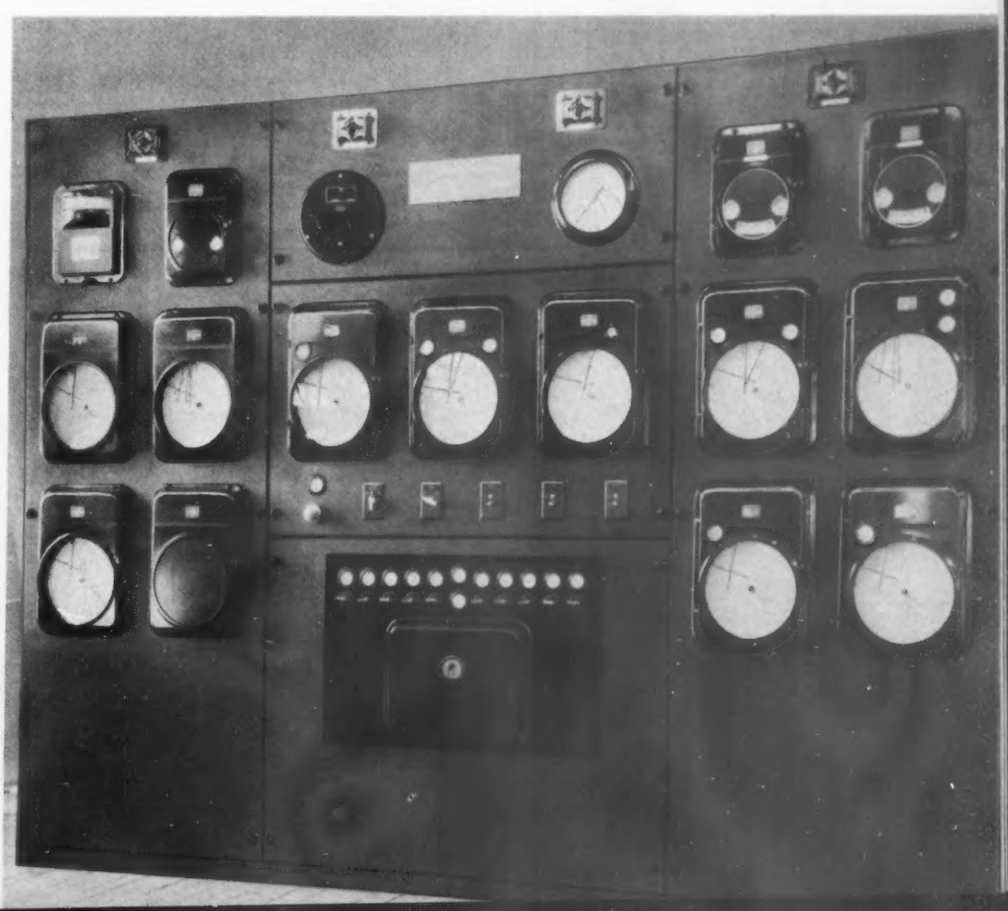
The evolution of such a system may be traced through a period of five decades. The first, 1890 to 1900, saw the advent of recorders in manufacturing plants for executive control. The recording pressure gage was one of the principal developments. Others included thermometers, voltmeters, ammeters and wattmeters. In the second decade, 1900 to 1910, the pyrometer and pyrometer-controller were introduced. These were of the electric type. The first pyrometer-controller was built in 1907 and the electric pyrometer was designed into an instrument that would withstand industrial use.

The third decade, 1910 to 1920, witnessed wide expansion in the use of recorders and controllers. In this period was introduced the program type of controller using a basic controller system plus a clock rotated cam. This cam was cut to conform to a predetermined cycle of holding, increasing and decreasing temperature values. The flow meter was introduced early in this period and other instruments were further improved, including electrically-controlled valves.

In the fourth decade, 1920 to 1930, the process cycle controller was pioneered and developed. The instrument was developed for the control of process operations on a time basis. One of the important phases of this development was the perfection of a controller for carrying out complete tire vulcanizing operations.

The current period, 1930 to 1940, sees a tendency toward centralized control panels in a large number of industries, including iron and steel, metals, metalworking, chemical, textile, food, printing and others.

Newly developed processes today are first perfected in the laboratory, then tried out on a small scale in a pilot plant before being placed in a large-scale operation. Each phase of the process is carefully developed by chemists and research engineers. In the laboratory and the



The complete process of recovering solvents is carried out by this group of co-ordinated instruments. The heart of the unit is the cycle controller in lower center

pilot plant these research men have every scientific instrument at their disposal for developing processes of commercial value.

However, the process of commercial value, to be a commercial success, must be conducted on a large scale in an industrial plant where it is impracticable for the scientist to watch the variables involved in the process. But, he knows that if the process is properly controlled, it will be successful on a large scale.

For these processes, co-ordinated control by instrumentation practically assures the scientist that the various highly-critical phases will be conducted along the exact lines determined in the laboratory under test conditions. Variables, such as temperature, pressure, flow and the time at which the successive stages of operation must be started, are highly important. It is often impossible for plant operators to carry out the schedule of operations, previously determined with mathematical precision; some complex operations could not be performed without instrumentation.

Instrumentation now has been developed to the point where complete process control systems, designed for each individual process, may be purchased in a single unit and plugged in as can the modern radio. In these units, the cycle controller or "mechanical brain" is the central unit which interlocks the necessary individual instruments for a given process.

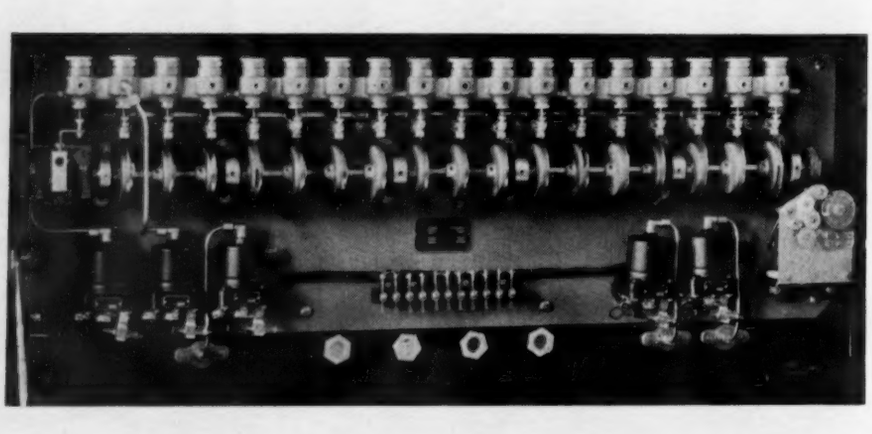
Single recording control instruments and groups of such instruments have been used for years in the metal producing and metalworking industries as well as every other industry where variable factors must be recorded or controlled. Completely coordinated instrument control already has made considerable progress in such industries as molded plastics, rubber goods, chemical, glass packaging materials, varnish, textiles, dry ice, food, tobacco and shoes.

Possibilities in the iron and steel and metalworking industries are regarded enormous by the instrument companies. Co-ordinated control of open hearth furnaces already is practically an established fact. In place of the usual practice of simply attaching various instruments to existing equipment, the steel industry is entering the phase where this equipment is designed and constructed to incorporate complete instrument control. Increasingly rigid specifications have made the steel industry more and more conscious of the need for instruments which eliminate the human variables in production.

Illustrative of the intricate processes in industry which may be automatically controlled is the equipment developed by one of the engineering companies for processing tobacco. This equipment adds moisture to tobacco in 19 minutes, replacing a previous sweat-room process requiring two weeks. During the 19 minutes, the automatic equipment operates 40 valves from one to six times each, thus performing a process which would be impossible manually.

According to every indication, the possibilities for instrument control are almost limitless—not for the purpose of replacing men but to enable them to perform a given job more expeditly.

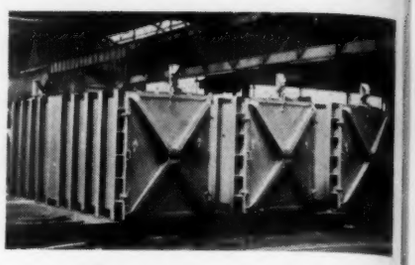
This cycle controller, or mechanical brain, for controlling an intricate, scientific, production process, performs its functions by means of 18 cams



Vacuum Treating Chambers Made Of Steel Plates

■ Chicago Bridge & Iron Co., 37 West Van Buren street, Chicago, has announced the construction of three vacuum fumigation treating chambers now installed in a food plant.

The three chambers illustrated are constructed of ⅜-inch steel plates. Each of the chambers is reinforced by 10 members, which were made by cutting 10-inch sections in half. Ends of these members were welded with a square butt-type joint. Girth seams in the plates forming the chamber are butt-type made with a single degree "V" welded from both sides. Longitudinal seams consist of two beads forming a ⅜-inch corner fillet weld.



Each of the three chambers is reinforced by ten members, made by cutting 10-inch sections in half

Reinforcing members were welded to the shell plates of the chamber by means of 3/16-inch centers on alternate sides of the members. There are some 300 feet of welding on the plates forming the shell and parts of each structure and 500 feet on the stiffeners of each structure.

Ready to Produce Cold-Drawn Stainless

■ Rustless Iron & Steel Corp., Baltimore, has completed installation of new equipment for the production of cold-drawn stainless steel. Housed in a new 1-story, 60 by 320-foot, brick and steel building, it includes a 50,000-pound cold-drawing bench which produces rounds and squares up to 3-inch and flats up to 2 by 4-inch. It draws two bars at the same time in sizes up to 1½-inch diameter. The new bench, practically automatic in operation, was built by Aetna-Standard Engineering Co., Youngstown, O.

After the bars have been drawn the tips are cut off. The bars then are passed through a straightener made by Medart Co., St. Louis. Next in line are three Cincinnati grinders which further finish the work. These are automatic in operation. When specified, the bars also are given an extremely fine finish by polishing, using equipment built by Production Machine Co., Greenfield, Mass. Facilities will be added later for automatically grinding and polishing flats, hexagons, squares and rounds.

The plant also is equipped with a Medart bar turning machine for producing rounds up to 6-inch diameter. At the end of the production line, a stock rack has been installed with capacity of 750 tons of finished material. Fred A. Emm is in charge of the cold-drawing department. Placing in operation of the cold-drawing department represents a further step in the expansion and rehabilitation program.

Tellurium Lead

Cracker pipe for use in a by-product coke plant evaporator is subjected on the interior to ammonia fumes and hydrogen gas and on the exterior to sulphuric acid. It is of tellurium lead

This new metal for pickling and plating equipment is highly resistant to corrosion. Its tensile strength increases when the metal is strained

BY I. H. SUCH
Associate Editor, STEEL

■ TELLURIUM lead sheets, pipe and coils are being used increasingly in plants handling sulphuric and sulphurous acids and in pickling, plating and other tanks containing corrosive liquids.

In many industrial and chemical plants throughout the country where tellurium lead equipment has been installed, it is demonstrating the same remarkable qualities shown in intensive laboratory and plant tests made before it was placed on the market.

Tellurium lead is a British discovery introduced into this country by the National Lead Co., New York, maker of sheet lead, lead pipe and a full line of other lead products. The product is made by adding a small quantity of tellurium, usually less than 0.1 per cent, to the St. Joseph Lead Co.'s chemical lead.

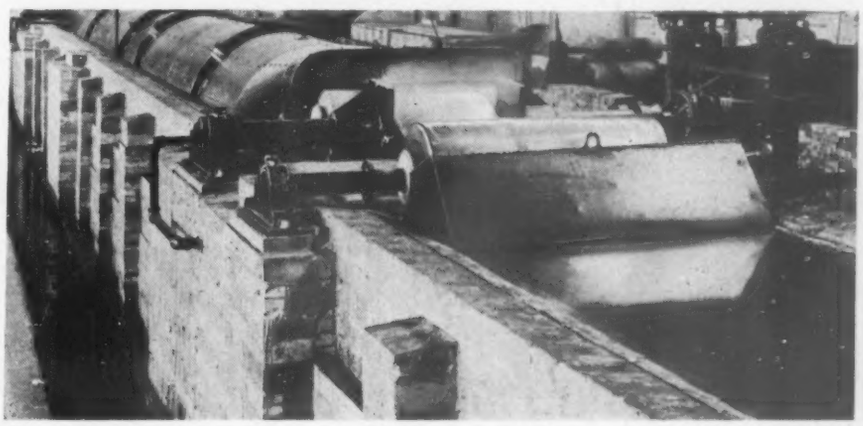
Changes Physical Structure

Addition of this small amount of tellurium to lead results in a marked change in physical structure. A finer and more uniform grain size is obtained and the coarse crystalline formations characteristic of some types of lead are eliminated.

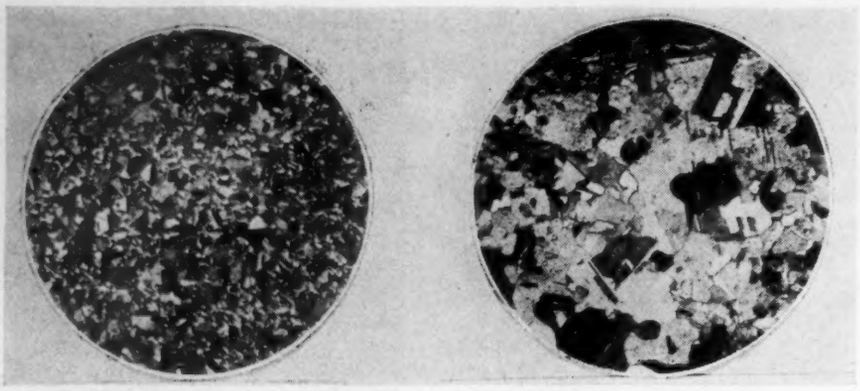
In addition to this fine grain structure, tellurium lead exhibits an unusually high resistance to corrosion by acids, even at high temperatures and where vibration also is present. Improvement in tensile strength also results—a tensile strength which actually increases when the metal is strained, diminishing the possibility of fatigue failure under conditions of vibration or prolonged stress. As an example, tests have shown that the hydraulic pressure required to burst a section of tellurium lead pipe is 75 per cent greater after stretching than before. Lead strips of the same material, overstrained 12½ per cent in a tensile machine, retained a 21 per cent increase in strength six months after overstrain.

Mechanical strength of the product is being demonstrated in the plant of an eastern chemical company where a 2½-inch pipe was used to replace antimonial lead pipe which carries alum liquor at a temperature of 90 degrees Cent. The antimonial lead pipe twisted and bulged after three months service but the tellurium lead pipe has been in use for well over two years without noticeable change.

Physical characteristics and corrosion resistance of a metal are related to some extent to its grain size.



This pickling installation at a continuous steel strip mill is lined with tellurium sheet lead and has pipe inlets and outlets of similar composition



Photomicrograph of a section of tellurium lead pipe is shown at left. The grain is finer and more uniform than that of ordinary lead pipe, a section of which is shown at right

Grain size, however, can be materially affected by the temperature to which a metal is subjected in service. A study was made recently of the grain growth of chemical lead and tellurium lead, both in rolled and extruded forms, when annealed at 150 degrees Cent. This temperature was chosen as being the ordinary maximum in service for lead chemical equipment.

Specimens ¾-inch wide, ⅛-inch thick and 6 inches long were annealed in oil and the temperature retained within 1 degree Cent. by automatic control. At designated times the specimens were removed and ½-inch pieces cut off the ends. The ends were polished, etched and photographed. Results are shown in the accompanying photographs. Grain size was classified according to procedure of the American Society for Testing Materials and was recorded in the accompanying table.

Grain Size Reduced

It will be noted that the average size of the grains in the untreated chemical lead was twice that of tellurium lead. On annealing at 150 degrees Cent., the rolled chemical lead showed practically no change for the first three months. Between three and six months, grain growth started to take place, increasing about 33 per cent during this time. In the case of tellurium lead, the grain growth started immediately on annealing, reaching an average of 0.12-millimeter, in three months. On further annealing of three months no increase in grain size or growth occurred.

There was a marked difference in the behavior of the extruded material on annealing. The chemical lead, which had grain size at the start twice that of tellurium lead, showed a decided increase in grain growth with a size greater than 1.0-millimeter in 32 days annealing. The tellurium lead showed a small grain size of 0.045-millimeter at the start which remained constant throughout the six months.

In a flash test, specimens of tellurium lead and chemical lead were held at 305 degrees Cent. in 96 per cent sulphuric acid for a period of three minutes. It was found that weight loss of the former was confined to 0.97 per cent, while that of the latter dropped 5.11 per cent.

Working qualities of tellurium lead are not impaired by increased tensile strength and corrosion resistance. The material in rolled form is stiffer than the usual lead sheet due to the work toughening which takes place but this characteristic does not imply brittleness. No signs of fractures are evident, even when sheet or pipe are hammered repeatedly. In burning or welding joints, the usual care must be used in keeping the surface free from foreign matter. Welded joints are best made with a slight reducing flame. Where the joint is to be built up with a strip or burning bar, this also should be of tellurium lead. Where greater rigidity and hardness are required, tellurium lead may be alloyed successfully with antimony and is available in analyses containing as much as 10 per cent antimony.

Tellurium lead is especially recommended for use in plants where equipment for one reason or another has proved unsatisfactory or troublesome. In an industrial plant employing phenolic compounds and sulphuric acid at temperatures up to 180 degrees Cent., considerable trouble was experienced with tank lining due to pitting. Shutdowns for repairs were frequent. Where replacements have been made with tellurium lead, these difficulties have been eliminated. Similarly excellent results have been obtained in plants handling hydrochloric acid fumes, hot chromium solutions, copper solutions, chlorine gas and hydrofluoric acid.

Grain Size, in Millimeter Diameters, of Tellurium Lead Compared with Chemical Lead

Treatment of Specimens	Rolled Sheet		Extruded Strips	
	Chemical Lead	Tellurium Lead	Chemical Lead	Tellurium Lead
Untreated	0.15	0.065	0.09	0.045
32 days at 150 degrees Cent.	0.12	0.09	1.0 plus	0.045
3 months at 150 degrees Cent.	0.15	0.12	1.0 plus	0.045
6 months at 150 degrees Cent.	0.20	0.12	1.0 plus	0.045

This wire pickling tank is lined with tellurium sheet lead and has a serpentine heating unit of the same composition

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Manufacture of Compressed Gases Increases as Applications Expand

(*Concluded from Page* 26)

cial applications have been developed because of the uniformity, high purity and chemical compositions peculiar to these gases.

An outstanding example of this, Mr. Farrar said, is the carburization of steel. About ten years ago his company developed the Pyrofax carburizing process, and this is used with air, he explained, for case hardening steel. He expressed his opinion that this presented a decided advance in the art of gas carburizing because many of the manufactured gases and some natural gases are not suited to this delicate operation.

Typical also of some of the special applications is the use of gases for atmospheres in furnaces, where freedom from impurities is an essential feature.

Commenting on the growth in sales in the past decade, he said it was about 1927 a number of large oil companies entered the field. Up to that time the major development and promotion had been conducted largely by the Carbide & Chemical Corp., he said. Reflecting the immediate effect of the entrance of these other companies in the field, sales in 1928 increased 314.6 per cent over those of the preceding year, Mr. Farrar pointed out.

One Regulator Suffices

The speaker discussed various factors entering into the development of the field and in comments on regulating equipment said that at first two regulators were required, one for stepping pressure down to from 30 to 50 pounds in the first stage and the other to stepping it down to approximately 6 ounces. However, now, he said, this is all done by one regulator.

He also discussed cylinders, marketing, appliances, rules and regulations governing installation of equipment and handling of gases, among other phases. In respect to oderants, he said that today practically all of these gases, used for fuel purposes, are oderized with ethyl mercaptam or some other material such as calodorent.

Most of his comments referred largely to the use of propane, because, he explained, this gas has largely dominated all others. However, he said, there had been considerable development in other gases, principally propane-butane mixtures and straight butane, especially in the past three years.

Reviewing developments in oxyacetylene over the past 25 years, E. A. Doyle, consulting engineer, the Linde Air Products Co., New York, said that one of the very latest processes is one called "flame softening." Under this process the surface of metal can be softened or toughened by heating and allowing a relatively slow cooling to follow. This is useful, he said, for conditioning the oxyacetylene cut edges of alloy steel shapes or of carbon steel where the effect of the cutting operation has left an embrittled condition.

No Finishing Required

With respect to oxygen cutting, he said that for many years it was thought that steel surfaces cut with an oxygen jet should be finished by machining, consequently accuracy of the process was not stressed. For some years now, however, it has been accepted that the oxygen cut surface when made by precision machine driven blowpipes is adequate for low carbon steels. Elaborate cutting machines are now found in the industry and mechanical cuts as deep as 18 inches are made regularly.

The oxygen jet is also being used for the removal of surface defects from iron and steel ingots, blooms, billets and slabs. The process, Mr. Doyle stated, is called "deseaming" and has become an important operation in the steel industry.

Pointing to various improvements over recent years in apparatus for utilizing oxygen and acetylene, he emphasized the importance of the invention of welding rods to give superior welding deposits.

Welding has also become mechanized for certain manufacturing steps such as tube welding and barrel welding. Semiautomatic welding is carried on in some work where flexibility is important. In much recent work multi-flame blow pipes have been used, he said.

Mr. Doyle said that while distribution of oxygen in the 3A type of cylinder is standard, distribution in liquid form has been developed and will have an important bearing on the future. Manufacturing plants have been much improved and individual plant capacities increased with resulting reduction in cost to the consumer.

Use of oxygen for chemical processes and for furnaces has not developed in anything like the extent predicted 25 years ago. Nor has the use of oxygen produced in air separation plants increased in use to great extent, Mr. Doyle asserted.

He enumerated a few highlights in the early days of the oxyacetylene development prior to 1913, or before the more modern day set in, listing them chronologically: 1892—discovery of calcium carbide from which acetylene is produced; 1895—liquefaction of air; 1897—dissolving compressed acetylene into an absorbent carried in a porous mask; 1902—separation of oxygen from liquid air; 1902—furnace tapping lance with separate oxygen stream; 1903—design of suitable blow pipe to give welding flame; 1907—oxyacetylene cutting blow pipe produced; and 1911—motor-driven cutting apparatus devised.

"The future of the oxyacetylene industry," he concluded, "would seem to be as manhood estate is to adolescence. In other words, the industry has come through its childhood period and is now in its teens."

Other speakers include Dr. C. E. MacQuigg, dean of the school of engineering, Ohio State university, Columbus, O., who reviewed the association's work on technical problems affecting transportation and storage equipment. Harry H. Mabey, Mathieson Alkali Works Inc., presented a review of the transportation of compressed gases, and Robert P. Baldwin, the Chlorine Institute Inc., summarized developments in the chlorine industry.

Design Provides Eight Diesels in Each Size

(*Concluded from Page* 41)

the camshaft and oil pump cover, the rotation of the camshaft can be made either clockwise or counterclockwise with any of the above accessory arrangements. The generator and air compressor or vacuum pump, can be mounted over the gear housing and drive direct from the cam and balance shafts, or attached to the side of the crankcase for belt drive. The fuel injectors are identical for all models. All these assemblies can be made with but a few right and left hand parts, the result being eight distinct models of each engine size.

Unit Is Convertible

■ A water unit that may be used for heating purposes in the winter and then converted into a cooling unit in the summer was recently developed by Hexcel Radiator Co., Racine, Wis.

Unit is made in both the pedestal and suspension types. Rotating louvers direct the air stream in any direction.

Finished in brown crackle and surrounded with a heavy bead of chromium, the unit is suitable for the home, office or store.

A.I.M.E. Arranges Program For Its Annual Meeting

■ FERROUS and nonferrous metallurgy assumes a prominent position in the preliminary program for the 148th meeting of the American Institute of Mining and Metallurgical Engineers at the Engineering Societies building, New York, Feb. 14-18. A wide variety of papers are listed for presentation at sessions of the Iron and Steel division and Institute of Metals division. In several instances, the two divisions have arranged joint sessions.

Sessions on blast furnace practice, steelmaking, and properties of steel, and the Howe lecture on stainless steel, feature the program of the Iron and Steel division. Among highlights of the Institute of Metals program are a two-session symposium on powder metallurgy, the annual lecture and annual dinner.

Of interest to all members is a session on mineral economics to be held on the afternoon of Feb. 14. Two important addresses will deal with "Interrelation of Technology, Economics and Government in a Balanced and Progressing Economy" and "Labor and Capital."

The institute will conduct its annual business meeting late on the afternoon of Feb. 15. The annual dinner will be served at the Waldorf-Astoria on the evening of Feb. 16 and upon this occasion formal award of medals and honorary memberships will be made.

Details of the annual meeting program of interest to the metalworking industry are as follows:

MINERAL ECONOMICS

Monday, Feb. 14

AFTERNOON

"Inter-relations of Technology, Economics and Government in a Balanced and Progressing Economy," by Harold G. Moulton, president, Brookings Institution.

"Labor and Capital," by Leo Wolman, professor of economics, Columbia university.

IRON AND STEEL DIVISION

Monday, Feb. 14

MORNING

Trend of Iron Ore Concentration

"Geology and Origin of New Jersey's Magnetic Iron Ores," by Meredith E. Johnson, assistant state geologist.

"Beneficial Results from Use of High-Iron Magnetite Sinter in Blast Furnace Operation," by C. E. Agnew, blast furnace superintendent, Alan Wood Steel Co.

Tuesday, Feb. 15

MORNING

Blast Furnace and Cast Iron

"Relative Desulphurizing Powers of Blast Furnace Slags—II," by W. F. Holbrook, bureau of mines.

"Efficiency of the Blast Furnace Process," by J. B. Austin, research laboratory, United States Steel Corp.

"Composition and Microstructure of Ancient Iron Castings," by Maurice L. Pinel, instructor in metallurgy, Columbia university, Thomas T. Read, professor of mining engineering, Columbia university; and Thomas A. Wright, technical director, Lucius Pitkin Inc.

AFTERNOON

Constitution, Treatment and Properties of Steel

"Constitution of Iron-Chromium-Manganese Alloys," by C. O. Burgess and W. D. Forgeng, Union Carbide & Carbon Research Laboratories Inc.

"Temperature Gradient Studies on Tempering Reactions of Quenched High Carbon Steels," by C. R. Austin, professor of metallurgy, and B. S. Norris graduate assistant in metallurgy, Pennsylvania State college.

"Grain Growth in Normalized Sheet Steel During Box Annealing," by M. L. Samuels, Battelle Memorial institute.

Wednesday, Feb. 16

MORNING

Deformation and Recrystallization

"The Yield Point in Metals," by Maxwell Gensamer, assistant professor of metallurgy, Carnegie Institute of Technology.

"The Yield Point of Single Crystals of Iron Under Static Loads," by Maxwell Gensamer, assistant professor of metallurgy, and Robert F. Mehl, director of metals research laboratory, Carnegie Institute of Technology.

"Magnetic Torque Studies of the Texture of Cold Rolled and of Recrystallized Iron-Silicon Alloys," by Leo P. Tarasov, research laboratory, General Electric Co.

AFTERNOON

Damping Capacity and Diffusion

"Damping Capacity Measurements in Metallurgical Research," by R. L. Flinn Jr. and John T. Norton, associate professor of physics and metals, Massachusetts Institute of Technology.

Thursday, Feb. 17

MORNING

Steelmaking and Steel Ingots

"Significance of Slag Control," by F. G. Norris.

"A Graphic Method for Analyzing Frequency Distribution Curves by Use of Probability Paper," by John A. Waterman, metallurgical department, Youngstown Sheet & Tube Co.

"Evolution of Gases from Rimming Steel Ingots," by K. C. McCutcheon, assistant general superintendent, American Rolling Mill Co., and John Chipman, professor, Massachusetts Institute of Technology.

"Distribution of Metalloids in Rimmed Steel Ingots," by J. W. Halley, metallurgist, and T. S. Washburn, metallurgist, Inland Steel Co.

AFTERNOON

Howe Memorial Lecture

"Stainless Steels," by Frederic M. Becket, president, Union Carbide & Carbon Research Laboratories Inc.

INSTITUTE OF METALS DIVISION

Tuesday, Feb. 15

MORNING

Constitutional Diagrams

"Solid Solubility of Mercury in Silver and in Gold," by C. H. Mathewson, professor of metallurgy, Yale university, and H. M. Day, research laboratory, General Electric Co.

"Solubility of Lead and Bismuth in Liquid Aluminum and Aluminum-Copper Alloys," by K. R. Van Horn, research metallurgist, Aluminum Co. of America.

AFTERNOON

Properties and Uses of Nonferrous Metals

"Creep and Fracture Tests on Single Crystals of Lead," by John B. Baker, professor, Drexel institute; Bernard B. Betty, International Nickel Co. Inc.; and H. F. Moore, professor, University of Illinois.

"Potential Measurements on Chempur Grade of Tin in Carbonate Solutions," by Gerhard Derge, assistant metallurgist, metals research laboratory, Carnegie Institute of Technology.

"Indium-Treated Bearing Metals," by C. F. Smart, metallurgist, Pontiac Motors Division, General Motors Corp.

"Calcium Metallurgy," by C. L. Mantell, consulting chemical engineer, and Charles Hardy, president, Charles Hardy Inc.

Wednesday, Feb. 16

AFTERNOON

Annual Lecture

"Nature of Metals as Shown by Their Properties Under Pressure," by P. W. Bridgman, Hollis professor of mathematics and natural philosophy, department of physics, Harvard university.

Thursday, Feb. 17

MORNING

Powder Metallurgy Symposium. I—Production, Testing and Uses

"Powder Metallurgy, Its Origin and Development," by Charles Hardy, president, Charles Hardy Inc.

"Production and Some Testing Methods of Metal Powders," by D. O. Noel, J. D. Shaw and E. B. Gebert, Metals Disintegrating Co.

"Types of Metal Powder Products — A Classification," by Gregory J. Comstock, Handy & Harman.

"Ductile Tantalum, Columbium and Molybdenum," by C. W. Balke, Fansteel Metallurgical Corp.

AFTERNOON

Powder Metallurgy Symposium. II—Hard Carbides

"Cemented Tungsten Carbide Alloys," by W. P. Sykes, General Electric Co.

"Tantalum Carbide Tool Compositions," by Philip M. McKenna, vice president and research director, Vanadium-Alloys Steel Co.

EVENING

Annual Institute of Metals dinner.

Friday, Feb. 18

MORNING

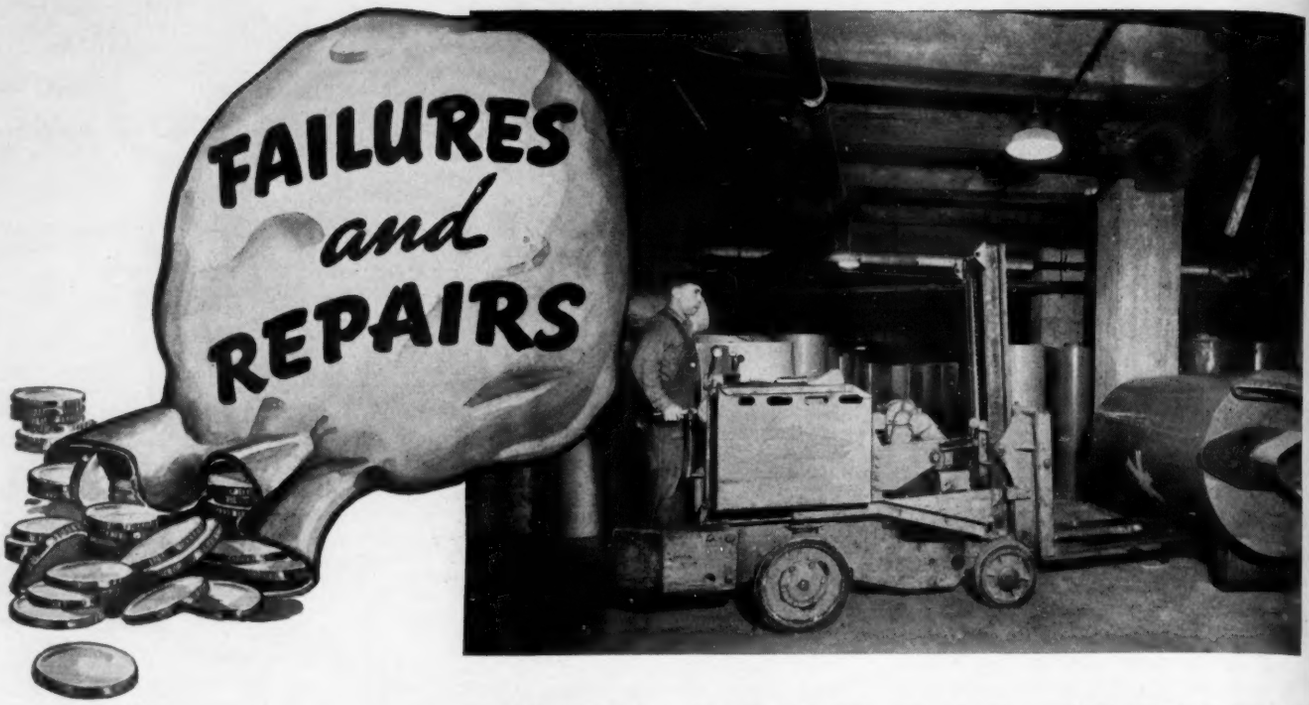
Copper Alloys and Platinum Metals

"Properties of the Platinum Metal: II—Tensile Strength of Platinum and Platinum Metal Alloys at Elevated Temperatures," by E. M. Wise, metallurgist, and J. T. Eash, metallurgist, research laboratory, International Nickel Co.

"Strain Transformation in Metastable Beta Copper-Zinc and Beta Copper-Tin," by Alden B. Greninger and Victor G. Mooradian, instructors in metallurgy, Harvard university.

"Deformation of Beta Brass," by Alden B. Greninger, instructor in metallurgy, Harvard university.

"An Investigation of Wire Bars of Electrolytic Copper," by Michael G. Corson, consulting metallurgist.

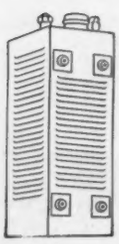


BOTH COST BIG MONEY

That's one of the reasons for the forward march to the steel-alkaline battery.

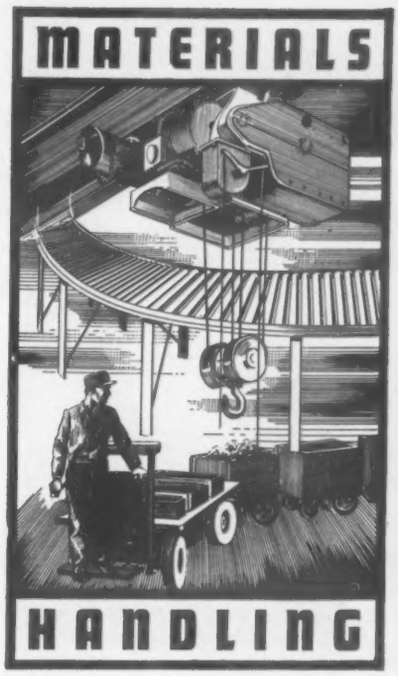
This power unit is tough. Doesn't fail suddenly. Requires virtually no time out for repairs. Examination of a single cell will show you that its inventor never expected it would. There's a filler-hole, yes. But otherwise it's in a sealed steel container. Its separators and its plates were meant to last the whole life of the battery.

In days when it's becoming increasingly hard to show a profit, "extras" have less and less excuse. When you buy steel-alkaline power units for your trucks you buy what you need for the service—not for the repair shops, too. Whether it's a small job or a big job, steel-alkaline batteries do it with a dependability no other power unit can even approach. Sales and service in principal cities.



EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY



Making Motors

Traveling cranes, hoists, jib cranes, monorails, floor trucks, tiering machines, dumb waiters and roller conveyors are synchronized into an efficient handling system

■ EFFICIENT routing of raw materials, subassemblies, frames, rotors and other partially completed parts as well as items in process such as coils and core laminations affords no little subject for study when the product is so widely diversified as that of Reliance Electric & Engineering Co., Cleveland.

If motors and generators were made in one size and type, it would simplify matters. Instead, the line of Reliance motors includes 50 different types of standard machines, most of which are manufactured in all sizes from 1 to 200 horsepower. In addition, 2, 3, 4 and 5-unit motor generator sets as well as much special equipment are produced. A typical morning's shipment may include six to two dozen different sizes and types of machines.

Although nothing particularly new is used in the handling system, it is interesting to note how overhead traveling cranes, hoists, jib cranes, overhead monorails, floor trucks, tiering machines, dumb waiters and roller conveyors are utilized to form a well co-ordinated system that handles materials through the plant with surprising efficiency considering the many factors involved.

To obtain the benefits of mass production, it is necessary to make a run of one type and size for stock, then change and make a run of another type or size. This soon accumulates a large stock—about 2000 finished motors, and unwound stators and rotors for about 1000 others being the usual amount kept on hand. These, however, are only certain sizes of standard induction motors, a majority of the motors and generators being wound on order even where the frames are stocked. It is impractical to stock even one each of all the various sizes and types.

The floor chart shown on next page roughly indicates location of various departments, the entire plant being on one floor with the exception of two departments where coils are wound and small motor rotors are cast. These departments are over the motor winding section in the northeast portion of the plant. An examination of this chart will show the plant is laid out so raw materials are distributed from the receiving platforms down along the south side of the plant. Materials are processed as they move crosswise to the north side where they are assembled to form the completed product which is also tested and crated along the north side finally reaching the shipping floor at the west end.

Electrical sheets are unloaded from flat cars with a 15-ton floor

View from test floor looking toward assembly department at left and machine shop and shipping department at right. Three levels of crane runways are shown

controlled electric traveling crane and grab. Another crane moves sheets to the coating department where they are dipped in water-glass and baked dry to form an insulating layer necessary for low core loss in electrical equipment. Sheets next go to the punch press aisle where they are punched and notched for the coils and assembled on spiders to form rotor cores or returned to storage for use in stators. Press dies are handled from maintenance and stock by an overhead crane. Punched sheet is stored on racks in skid boxes handled by electric truck and a tiering machine.

Steel bar and shaft stock is unloaded from flat cars by crane and sling to storage racks. Cutoff saws, cutting torch and center boring lathe are located nearby. Shaft stock is handled on skids and in skid boxes by electric truck from here to the shafting aisle where all machines are served by individual jib cranes. These cranes with hand chain hoists are so located that they pick up work from preceding unloading deck, load the machine tool and unload to a deck reached by the jib crane serving the next machine. This provides a continuous flow of work with minimum handling.

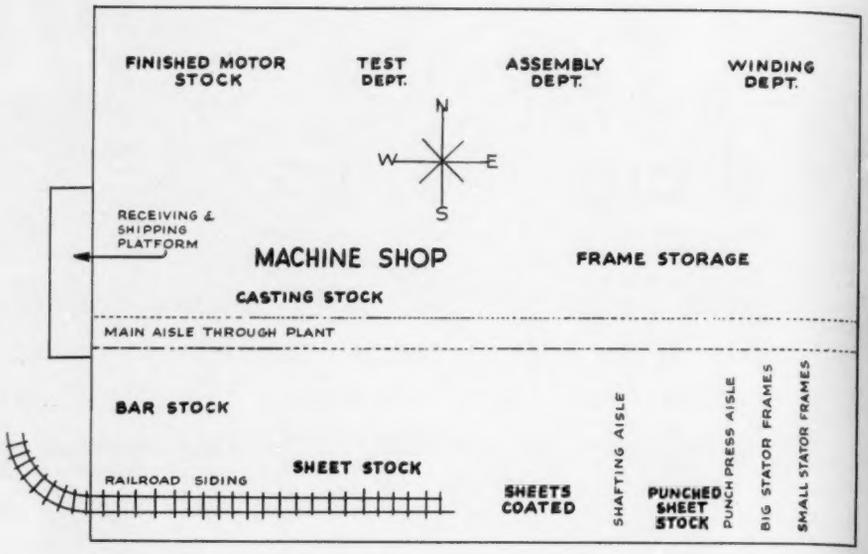
Use Skid Boxes

Bar stock for frames is saw or flame cut depending upon the type of welded joint used, rolled to circular shape, ends butt welded in a fixture and trucked in skid boxes to the gravity roller conveyor in the small frame aisle or unloaded in the large frame aisle.

The small frame aisle utilizes a gravity conveyor to carry frames from the first welding station where the stator rings and cross bars are assembled, to the drilling and tapping station and to the core assembly fixture. Here a short auxiliary conveyor brings up the core laminations in stacks weighed out for each frame. Then an adjoining section of conveyor carries the frames to the lathe machining the end rings, the machine where holes for the lifting eyes are drilled and tapped, on to the cleaning table and to frame storage.

Larger frames for motors above 50-horsepower are assembled in the adjoining aisle served by four overhead cranes. Rotor cores and commutators, where used, are assembled on cast iron spiders. Shafts are not an integral part of the rotor assembly but are pressed in or out of this spider permitting shafts to be changed to suit various applications, a feature of Reliance motors.

Frames and rotors go to the winding department either from stock or direct from the fabricating aisles, small parts traveling on a gravity roller conveyor, larger ones

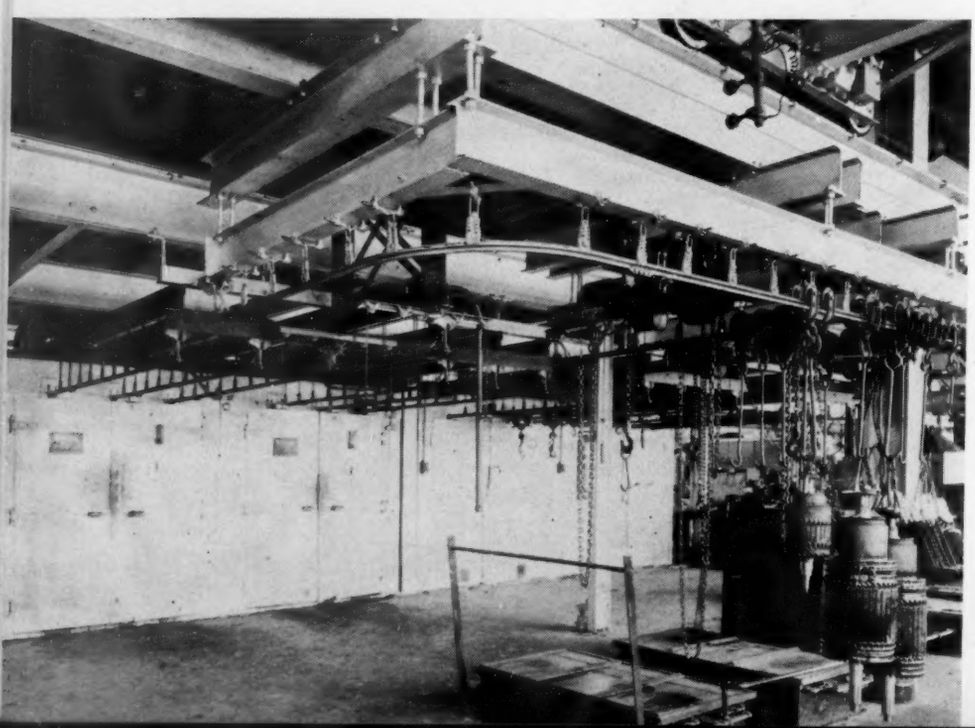


This diagram shows location of departments and fabricating aisles at plant of Reliance Electric & Mfg. Co., Cleveland. It is not drawn to scale

by overhead crane. Coils wound on the second floor come down on a dumb waiter and are hung on an overhead monorail system where they are dipped in insulating varnish and oven baked. They are then stored in bins until required for motor winding. Certain types of small motors do not have coils treated before winding, the insulation being applied by dipping and baking the entire stator or rotor after it has been wound. The overhead monorail system used with the dipping vats and bake ovens is a most flexible arrangement, a requirement necessitated by the many different types of rotors and stators handled in addition to the coils just mentioned. Some stators due to service conditions require more dips and bakes than others. Four bake ovens, each with three monorails, are served by a transfer bridge connecting a semi-circular monorail. Sections of this monorail extend under the cranes serving the winding department and also over the dipping tanks. Routing is thus extremely flexible.

Winding department is in two

(*Please turn to Page* 69)



Overhead monorail system serving bake ovens and dipping tanks two of which are in immediate foreground. A movable bridge permits transfer of hoist and carrier elements from main lines to any of the 12 lines serving the four bake ovens

"Sure, I'm a TOUGH GUY ... sometimes!"

"I saw an advertisement run by The Associated Business Papers that pictured me as typical of the prospects that advertisers' salesmen classify as 'tough guys.' The ad went on to say that while I am tough when salesmen call, I am pretty regular when I am reading an A.B.P. publication. Well, I don't resent it a bit. With so many keen salesmen calling on me every day, I have to pretend to be hard-boiled most of the time.

"But you can be sure that I put aside that 'protective mask' when I am reading STEEL because that is where I go to keep in touch with trends and developments; for practical ideas suggested by an editor who is familiar with my business. I know that STEEL is written for *me*, not for its advertisers. Yet I read the ads, too, because I know that they are in there only because they have something to offer—not because they got editorial publicity."

Steel Frame Is Designed For Light Load Buildings

By J. EDW. TUFFT

■ AN INTERESTING example of the use of steel framework in a light load building is apparent in the new La Vina tuberculosis sanitarium, endowed institution in Pasadena, Calif. The sanitarium, erected at a cost of $135,0000, takes the place of the original wooden buildings destroyed in a forest fire. It is a 1-story structure consisting of eight attached and semiattached units surrounded by lattice steel pagolas. Architects were Myron Hunt and H. C. Chambers, Los Angeles, and the general contractor S. O. Bennett, Pasadena. The steel framework is the product of the Latisteel Corp. of California, 3110 East Foothill boulevard, Pasadena.

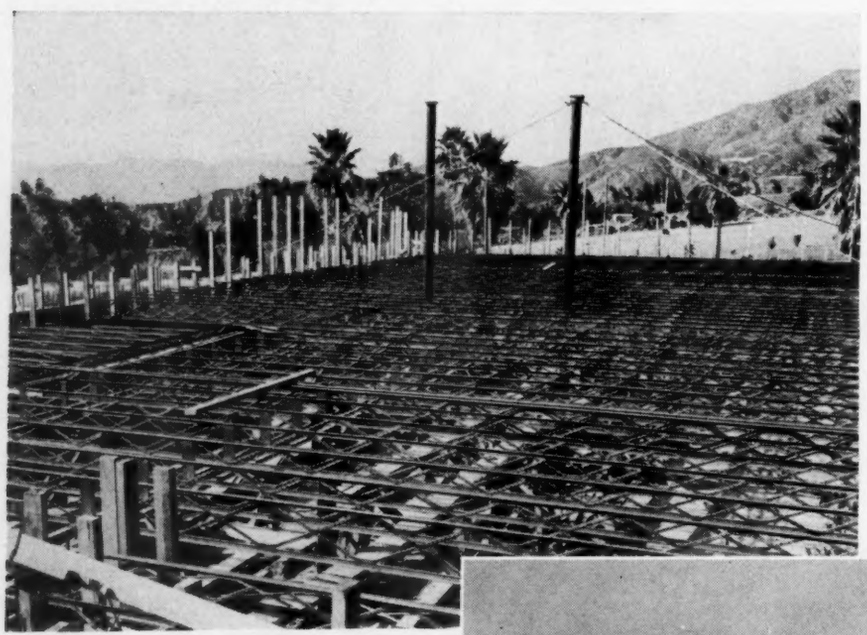
This type of steel frame has been used in walls, floor and roof. It not only provides the load carrying and forming elements but it affords direct attachment for the wall finishing element. Wall, ceiling and roof materials anchored to the steel framework serve as diaphragms developing the requisite rigidity. The outstanding feature of this type of framework is the diagonal steel bracing, for the most part prefabricated. This diagonal bracing serves as the furring members and it provides ample strength to resist wind and seismatic forces. In addition, the diagonal bracing scheme produces truss framing above openings, such trusses being continuous with and integral with all other truss structure in the walls.

A further additional advantage is its suitability to structures of a more complex nature without loss of relative economy. It should be noted that all diagonal bracing in Latisteel is welded and that sections when assembled into a complete building frame likewise are welded together into a continuous whole.

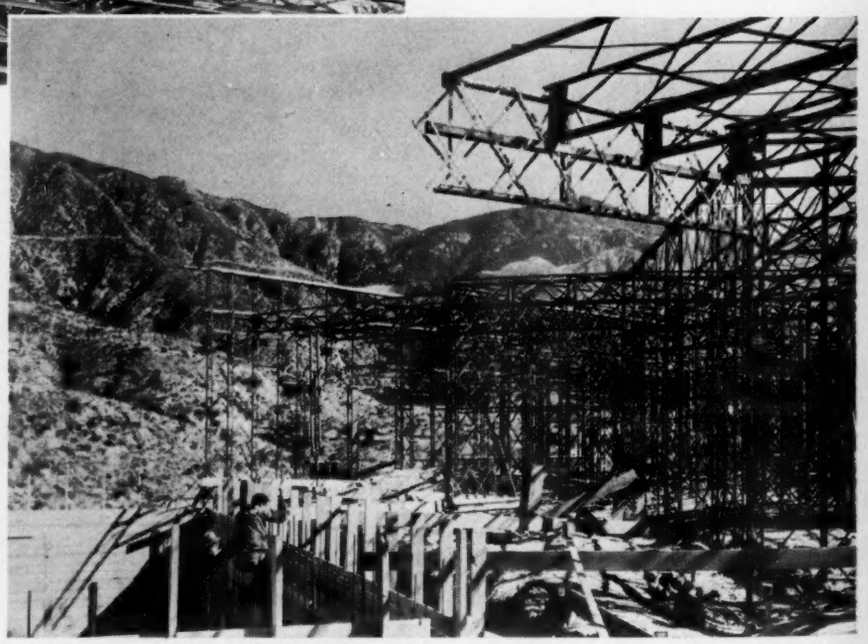
In prefabrication the structural rough dimensions of each wall are laid off on the shop floor. The steel studs are spaced, the top and bottom angles are placed and welded, forming the ultimate top and bottom plates. The collapsible and adjustable Latisteel fabric is stretched over the stud frame, including the architectural openings, and welded at every point of contact with the studs and angle plates. The openings are then burned out with the torch and the whole wall panel becomes in effect a very deep and rigid truss. For convenience in handling the panels are cut in such a way that they can be recombined on the job in a precise manner without interfering with the continuity of the whole mass.

Because of the varying land levels at La Vina and other unusual features a certain amount of the fabrication was done on the site, an obvious advantage for the steel could be cut to measure with all the speed and ease of wood dimension timbers.

This sanitarium, with a floor area



This steel flooring for light load buildings is pre-fabricated in the shop and assembled on the building site



In addition to construction of frame members by welding, these members are joined by welding in the field into a continuous whole

of approximately 17,000 square feet and with the units ranging from 1420 to 3600 square feet, was first outlined with tubular scaffolding, using 2-inch posts. The Latisteel sections were welded in, filling the open wall, floor and ceiling spaces between the tubular scaffold members. Footing sleeves to receive the tube frames were embedded in the concrete foundation. Such sleeves have 4-inch outside diameter and contain reinforcing members welded to the bottom. The tube couplings are steel castings. The inner surfaces are grooved to provide structural engagement.

Mats Are Adjustable

Walls consist of Bethlehem hot rolled and hot expanded vertical steel studs with horizontal lines of steel bridging. Against the exterior face of the walls is welded the diagonal mats which are collapsible for easy handling and are adjustable for exact coverage. After tying the metal lath to the lattice like exterior wall surface the lath was plastered and back plastered with concrete plaster to a thickness of 1½ inches and then finished with stucco of the color selected by the architect. Partition studs and inner surfaces of exterior walls were clad with one inch of insulation material and plaster base to which interior plaster was applied.

Floors and roofs were framed with Bethlehem hot rolled and hot expanded steel joists. For horizontal diaphram action Latisteel diagonal mats were welded to the top surfaces of the roof joists and all marginal ends were welded to the supporting walls. Floor and roof joists support 2-inch concrete slabs in which welded wire mesh, in addition to Latisteel mats, is embedded. Floors were steel troweled to receive their rubber tile finish. Builtup felt roofing waterproofs all roof slabs.

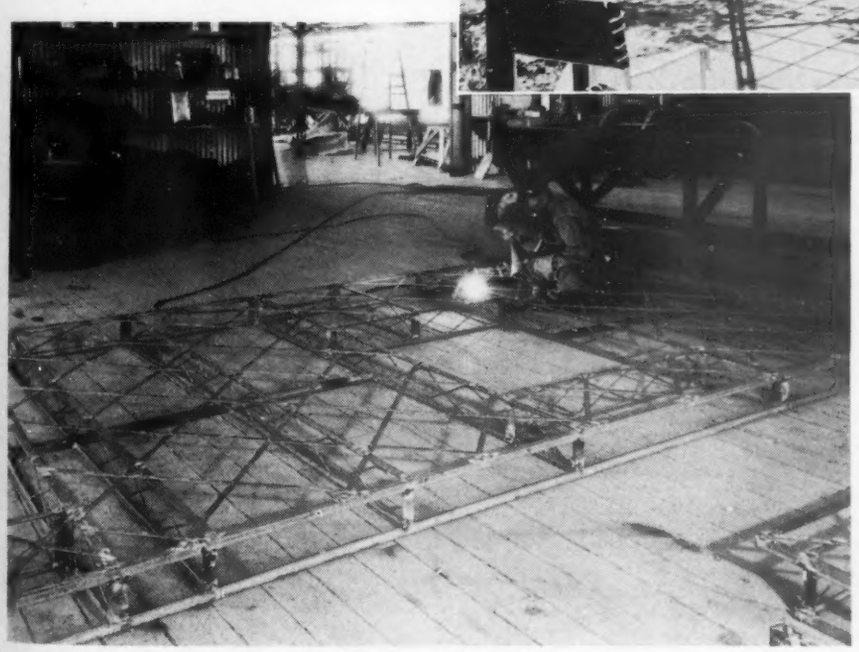
This system produces a building which is wind, earthquake and termite proof.

Construction is said to be economical in proportion to the simplicity of the building, the more simple types naturally permitting a far greater degree of prefabrication. Construction is especially rapid, when the panels come prefabricated from the factory and are set in place with the minimum amount of field labor. There is practically no added cost involved in making a wall thicker up to certain limits. Mr. Hunt comments that the open lattice construction in this building accommodates itself to other trades; it is not necessary to drill through studs and consequently weaken them when installing electric wiring conduits or plumbing pipes.

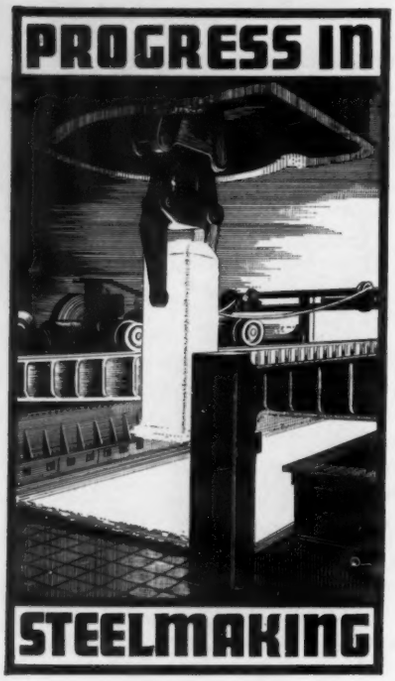
"The ability to cast a concrete floor slab or roof slab on the steel elements," says Mr. Hunt, "and have those elements act as reinforcement of slabs in such a way as to transfer by way of diagonal lines the horizontal forces in such slabs to the walls, the walls in turn transferring them to the ground, is from an engineering standpoint the principal advantage of this type of construction. This asset is also doubled in value by reason of the fact that the steel members are used in floors, ceilings and in the walls, while the joints between any two of these are welded joints."

F. H. Ruppel, president, Latisteel Corp. of California, says: "Steel structural work of this kind for buildings of this character and for industrial buildings is gaining in popularity not only because of its engineering honesty, its convenience in handling and its general economy, but also because the steel structural manufacturer has not overlooked the convenience of other trades. We have had in mind the plumber, electrician, concrete worker, plasterer, roofer and everyone else who comes into the building picture."

From the architect's standpoint, this system offers wide latitude. Above is seen one view of the finished building, showing the lines of modern simplicity



Structural dimensions of the wall are laid off on the shop floor and panels are built up of steel members cut to length and welded. The panel shown is 86 x 46 inches and was shipped in two sections of 23 feet each



Strip Annealing

Cycle to be used in heat treating hot-rolled strip steel is determined by the chemical, physical and mechanical factors involved in the specification

By T. N. KEELAN

■ ANNEALING of strip is one of the most important and vital steps in the successful production of a satisafctory product. Cold strip frequently is rejected by the consumer because of "blue," stained, hard, low-ductility or overannealed steel. The effects of loose and red oxide on material requiring steam blue finish as well as the effects of improper physical properties on hot rolled orders also lead to rejection by the buyer.

Production of satisfactory hot or cold rolled strip from the annealing department is popularly supposed to be solely the function of the annealing practice equipment and personnel. However, it is well known that annealing setups vary from one mill to another and that much secrecy and mystery surround the practices in use on the various grades of strip.

The purpose of this article and others to follow is to analyze and compare various annealing practices in use at several plants producing hot and cold rolled strip in order to bring out the pertinent factors that should be considered in annealing the various grades.

Theoretically, annealing of strip steel consists of three phases: Heating the steel above the lower critical range of 1292 degrees Fahr., holding within this range until the steel is uniformly heated, and cooling slowly to atmospheric temperature—all in the presence of a suitable atmosphere.

In the actual practice of manufacturing cold strip, theory is closely followed but on most grades of hot strip a variation from theoretical temperatures has been found necessary as will be shown later.

In general, good annealing practice incorporates the following:

1. Firing (heating to a definite temperature) at a definite rate.
2. Soaking (holding at definite temperatures) for a definite time.
3. Cooling slowly (under cover).
4. Atmospheric control (firing, soaking, and/or cooling in deoxidizing or oxidizing atmosphere).

To properly set up a suitable annealing practice on an order the annealer must bear in mind the following:

1. Chemical analysis.
2. Treatment prior to arrival at the annealing department.
3. Physical characteristics of the material including the gage, width, length, and whether coils or flats.
4. Subsequent treatment to be given after annealing.
5. Physical properties desired.
6. Surface finish required.

Knowing the foregoing data, the history of the order, and the equipment, the annealer is in a position to specify the annealing practice and cycle to be used. This procedure can best be illustrated by citing the annealing setups on the various grades of hot rolled strip.

Strip Mill "M"

Widths on flats and coils range from 24 to 48 inches; gages from 0.0478 to 0.250-inch on flats and 0.0359 to 0.165-inch on coils. Finishing temperatures vary with the gage. The mill, classed as slow, delivers 0.093-inch gage at about 1440 degrees Fahr. No runout table is provided; practically all orders are coiled on reels located about 50 feet from the finishing stand. This necessitates most orders being finished either by uncoiling and cutting to length, sending through a breaker, or skin rolling.

Annealing equipment at this mill consists of side-fired 1-box type furnaces and radiant tube type furnaces. Iron-constantin thermocouples are located midway in the corners at the front and rear of the box furnaces whereas in the tube type units, the couples are located in the center at front and rear. Hot-rolled orders are annealed by furnace temperatures only, the operation being confined to box-type furnaces. Cold-rolled orders are worked in both box and tube furnaces with furnace temperatures in box type and both the steel and furnace temperatures in the tube type. Deoxidation is done by DX gas made from coke oven gas. Steam connections are available at all cooling stations for blueing. Charges of flat stock weigh from 25,000 to 50,000 pounds while coil charges, if piled 1-high, run about 35,000 pounds.

Annealing practices in vogue at this mill are as follows:

Hot Rolled Grades

1. *Low-Carbon Flats* (0.08 to 0.120 per cent), not breakered or skin rolled:

Firing: Bring furnace to 1400 degrees Fahr. in 4 hours.

Soak: at 1200 degrees Fahr. for a total of 24 hours depending on the pan weight. (25,000 to 30,000 pounds requires 24 hours; 50,000 pounds is given 36 hours total).

If softer stock is needed the following treatment is administered:

Firing: 5 hours at 1400 degrees Fahr. furnace temperature.

Soak: at 1235 degrees Fahr. for a total of 28 hours or longer, depending on the pan weight.

2. *High-Carbon Flats* (0.20 to 0.30

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per cent), not breakered or skin rolled:

Firing: Bring furnace to 1400 degrees Fahr. in 4 hours.

Soak: at 1300 degrees Fahr. for a total of 24 hours or longer.

3. *Low and High-Carbon Flats,* breakered or skin rolled:

(18 gage and under)

Firing: bring to 1240 degrees Fahr. in 4 hours.

Soak: at 1150 degrees Fahr. for a total of 30 hours.

(Over 18 gage)

Firing: 2 hours to 1240 degrees Fahr furnace.

Soak: at 1075 degrees Fahr. furnace for 30 hours total or longer.

4. *Normalized Flats,* pickled or unpickled:

Firing: 4 hours to 1400 degrees Fahr. furnace.

Soak: 1200 degrees Fahr. furnace for 30 hours total or longer.

5. *Coils,* not rewound, pickled, slit, breakered nor skin rolled:

(19 and 18 gages)

Firing: 4 hours to 1400 degrees Fahr. furnace.

Soak: 1250 degrees Fahr. furnace for total of 24 hours or longer.

(16 gage and heavier)

Firing: 4 hours to 1400 degrees Fahr. furnace.

Soak: 1325 degrees Fahr. furnace for total of 24 hours or longer.

6. *Coils,* rewound, slit, pickled, breakered or skin rolled:

(18 gage and lighter)

Firing: 4 hours to 1250 degrees Fahr. furnace.

Soak: at 1175 degrees Fahr. furnace for 30 hours total or longer.

(Over 18 gage)

Firing: 2 hours to 1250 degrees Fahr. furnace.

Soak: at 1100 degrees Fahr. furnace for 30 hours total or longer.

Steam blue finish is obtained on any of the foregoing grades by applying steam to the charge on the cooling bed, when it has cooled sufficiently so that there is no danger of blowing the sand seal on the base. The pot temperature should range from 800 to 1000 degrees Fahr. When the pot temperature and disconnecting steam reaches about 400 degrees Fahr., the steam is disconnected. This gives a fairly tight blue oxide with no danger of red oxide occurring. Further, when a good tight oxide is required, it is the practice to pickle, scrub and dry the flats prior to annealing and steaming.

In addition, on hot-rolled orders requiring steam blue finish but no particular physicals, the following annealing practices are proving satisfactory:

7. *Coils:*

Firing: to 1300 degrees Fahr. as soon as possible.

Soak: 1300 degrees Fahr. for a total of 16 hours.

Steam: apply as previously described.

8. *Flats:*

Firing: to 1250 degrees Fahr. furnace as quickly as possible.

Soak: 1250 degrees Fahr. furnace for total of 24 hours.

Steam: apply as previously described.

Numerous attempts to deoxidize hot-rolled stock were not satisfactory; hence, no deoxidizing is done on such stock.

STRIP MILL "O"

This mill rolls flats and coils in widths from 24 to 60 inches thicknesses from 0.0478 to 0.500-inch in flats and 0.043 to 0.100-inch in coils.

Finishing temperatures and practice on commercial hot-rolled orders vary with the gages as follows:

Gage, inches	Finishing Temp., degrees Fahr.	Practice
0.043 to 0.054	1300/1340	Coiled
0.055 to 0.068	1400/1440	Coiled
0.069 to 0.074	1430/1480	Coiled
0.075 to 0.084	1460/1500	Coiled
0.085 to 0.100	1500/1520	Coiled
0.101 to 0.115	1520/1540	Cold sheared, piled hot.
0.116 to 0.145	1540/1560	Cold sheared, piled hot
0.150 and up	1580 minimum	Cold sheared, piled hot

All orders 0.100-inch and thinner are coiled on reels located about 100 feet from last finishing stand after which flats are upcut to length or breakered, cut and piled cold whereas heavier stock is sent over the runout table and sheared to length and piled.

The annealing equipment at this mill is about the same as at mill "M." However, annealing is done by inside pot temperature from thermocouples located in top and bottom of the charges. Pan weights range from 50,000 to 100,000 pounds.

Annealing practices followed by this mill on hot-rolled orders show:

1. *Low-Carbon Flats,* breakered:

(18 gage)

Firing: So conducted that inside top and bottom temperatures are equalized at 1200 degrees Fahr. top and 1150 degrees Fahr. bottom.

Soak: at same temperatures for 10 hours for stock under 24 inches wide, 15 hours for stock 24 to 36 inches wide, and 20 hours for stock over 36 inches wide.

(16, 14 and 13 gages)

Firing: Equalize at 1250 degrees top and 1200 degrees bottom.

Soak: at same temperatures for 10 hours or longer depending on the foregoing widths.

2. *Low-Carbon Flats,* breakered, pickled, cold rolled and steam blued:

Firing: equalize at 1050 degrees top and 1000 degrees bottom, stop firing.

Soak: furnace dead soak at 800 degrees top and pull charge.

Steam: add as soon as pulled, disconnect at 600 degrees top.

DX gas: connect after steam.

3. *Low-Carbon Flats,* cobbles, three front and three back cuts from coils:

Firing: equalize at 1125 degrees top and 1075 degrees bottom.

Soak: at same temperatures for 10 hours or longer depending on width previously stated.

4. *Low-Carbon Flats,* cold sheared, piled hot, 0.100-inch thick and over:

Firing: equalize at 1250 degrees top and 1200 degrees bottom.

Soak: at same temperatures for 10 hours depending on width as previously stated.

5. *Low-Carbon Flats,* cold sheared, piled blue, 0.100-inch thick and over:

Firing: Equalize at 1175 degrees top and 1125 degrees bottom.

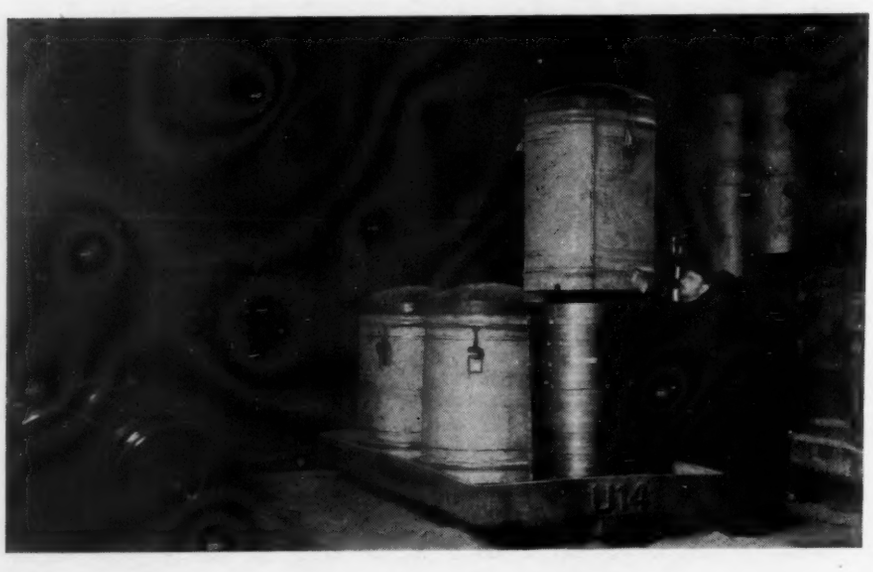
Soak: at same temperatures for 12 hours for stock under 24 inches wide, 17 hours for stock 24 to 36 inches wide, and 22 hours for stock over 36 inches wide.

6. *High-Carbon Flats,* (0.30 to 0.40 per cent), cold sheared, piled hot:

Firing: Equalize at 1300 degrees top and 1250 degrees bottom.

Soak: at same temperatures for 10 hours as minimum for stock under 24 inches wide, 15 hours as minimum for stock 24 to 36 inches wide, and 20 hours as minimum for stock over 36 inches wide.

7. *Low-Carbon Coils,* rewound, slit,



Preparing coiled strip for the annealing operation. Each stack is capped and the whole covered with a cast steel cover sealed at the base with sand

skin rolled, cold rolled, breakered:

(0.078-inch and lighter)

Firing: Equalize at 1150 degrees top and 1100 degrees bottom.
Soak: at same temperatures for 12 hours for stock under 24 inches wide, 17 hours for stock 24 to 36 inches wide, and 22 hours for stock over 36 inches wide.

(From 0.079 to 0.125-inch)

Firing: Equalize at 1100 degrees top and 1050 degrees bottom.
Soak: at same temperatures for 12 hours or longer depending on the width.

8. *Low-Carbon Coils*, not rewound, pickled, slit, breakered, not cold rolled:

(Semikilled silicon steel, 19 and 18 gage)

Firing: Equalize at 1230 degrees top and 1180 degrees bottom.
Soak: at same temperatures for 20 hours.

(Semikilled silicon steel, 16 gage and heavier)

Firing: Equalize at 1300 degrees top and 1260 degrees bottom.
Soak at same temperatures for 20 hours.

9. *Low-Carbon Flats*, normalized, not pickled:

Firing: Equalize at 1225 degrees top and 1175 degrees bottom.
Soak: at same temperatures for 20 hours.

10. *Low-Carbon Flats*, normalized and pickled:

Firing: Equalize at 1175 degrees top and 1125 degrees bottom.
Soak: at same temperatures for 20 hours.

Steam blue practice is about the same as that given under strip mill "M" and can be applied to any of the foregoing grades. Mill "O" finding it impractical to deoxidize hot-rolled stock had no setup for that grade.

To the uninitiated, this may seem to be a variety of annealing setups but examination will reveal a multitude of grades differing in chemical composition, prior treatment, specified physicals or subsequent treatment which necessitates so many different cycles of time and temperatures.

Comparison of the practices at these two mills reveals that mill "M" works to furnace temperatures while mill "O" works to pot or steel temperatures. Further examination, however, shows little difference in the time and temperatures used if allowances are made for differences in size of charged weights and in differentials between pot and furnace temperatures.

The greatest discrepancy appears to exist in the methods of firing. Mill "M" brings up the furnace temperature rapidly and cuts back to the soaking temperature. Mill "B" fires more slowly keeping the top and bottom inside temperatures reasonably close so that the charge can enter the soaking range at the pot temperatures listed. Both methods of firing have advantages and disadvantages.

Rapid firing of hot-rolled stock is well adapted to pickled, scrubbed and dried grades to eliminate stains and sweating. Such a manner of firing gives fairly uniform physicals on strip up to 48 inches wide and on the heavier gages.

Slow firing seems to give more uniformity from edge to center on widths over 48 inches. The lighter gages also respond better in the way of more uniform physicals. Shape and flatness on lighter gages seem to respond better. Slow firing requires the use of thermocouples and adds to annealing costs.

From a tonnage standpoint, there is not much difference, both methods average about 1½ tons an hour.

A treatise on "Annealing of Cold Strip" will be presented in an early issue—THE EDITORS.

Pipe Spans Are Unusual Length

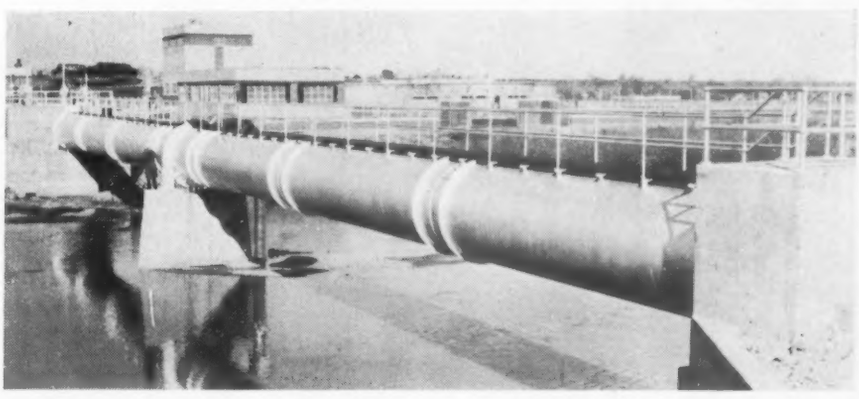
■ Two spans of pipe, each 105 feet long, carry sewage across the Platte River at Denver.

Principle involved in construction of such long spans is that of preventing distortion at points of support by welding stiffener rings to the pipe. These rings transmit the load to the foundation by means of legs attached. Use of the new method of construction demonstrated a saving in cost of 22 per cent over the next most economical design, and offered less obstruction to flow inside the pipe. The welding was done by the shielded arc process with equipment manufactured by Lincoln Electric Co., Cleveland. As supplied for the spans, the pipe is 78 inches in diameter, and ranges in thickness from ⅝-inch to 1⅛ inches. The stiffener ring at the center pier is a 12-inch 40 pound I-beam rolled edgewise. Legs on this ring are rigidly fastened to the center pier. Stiffener rings at the ends of the pipe are 10-inch 30 pound I-beams. Legs on these rings rest on patented rollers. An expansion joint in the wall at each end of the pipe allows it to expand both ways from the center. All seams were butt welded electrically.

The pipe was designed as a continuous structure for a maximum combined fiber stress of 9800 pounds per square inch in the pipe shell, and 16,000 pounds per square inch in the stiffener rings. Maximum negative bending moment at the center pier is 4,138,000 pounds feet. It occurs at points 39 feet 4 inches from the end supports.

The pipe was designed, fabricated of copper molybdenum iron by electric welding and erected by the Thompson Manufacturing Co. Denver.

Each span of pipe is 105 feet long. The structure carries sewage across the Platte river at Denver



Buffing Compositions Made by New Methods

■ New method for producing buffing compositions has been developed by Bruce Products Corp., Detroit, as bars are made by mixing, shreddling, vacuumizing, cooling and forming in one continuous operation with no interval.

Result is said to be a bar of entirely new structure containing desirable ingredients formerly impossible to include. Uniformity and density have been improved and air pockets and innumerable other voids usually found in molded solids have been eliminated. The products are being marketed under the names of Tri-Vac, buffing composition for base metals, Li-Vac, for plated metals, and Lub-Vac, polishing wheel lubricant.

By ROBERT E. KINKEAD

On this page the author, well-known consulting engineer in welding is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

Plenty of Excitement In Welding Field

■ As manufacturing industry starts up again, new welding methods and processes are receiving consideration.

In many cases, new ideas are being applied which are not advertised or covered by technical papers by their sponsors. If the reader can accept rather sketchy information, the only kind that may be given under the circumstances, he will be convinced that there will be plenty of excitement in the welding field during the coming year.

One new automatic arc welding process uses a standard bare wire feeding head and does away with coating and tape entirely, and uses a shielding of gaseous elements which is an outgrowth of many years of effort to make this scheme work. Low initial cost of the installation and lower production costs than manual welding with extruded covering are promised. Paralleling the as yet unpublicized Unionmelt process comes the carbon arc automatic using 2000 to 5000 amperes capable of welding heavy plates and putting on 150 to 400 pounds of weld metal per hour. Development of multiple tip oxyacetylene blowpipes capable of burning 1500 to 2000 cubic feet of acetylene per hour is forecast in the field of surfacing or cladding steel. Automatic welding with the blow torches promises to take a new spurt in view of experience in 1937 with important processes.

In the field of accessory equipment developments are coming fast. New equipment for air conditioning the welding department is being given field service tests. Positioning equipment is being built to handle jobs weighing up to 20 tons. By use of these manipulators larger rods may be used for welding and lower costs obtained. Instrument checking of welds as they are made is being used in the spot welding and arc welding field. New flash trimmers for resistance welders trim the flash on the fly and further increase the speed and applicability of flash welding.

Comments on Welding

■ The British magazine "The Welder", recently canvassed prominent engineers in England for opinions on progress being made in welding. Significant is the comment of Sir Alexander Gibb, president of Institution of Civil Engineers and also the Institute of Welding.

"Welding must pass through three stages of development. First; the workshop manager applies it like a new tool, as a new and better method of manufacturing an old product. Next, the designer re-designs the product to obtain fuller benefit from the welding process. In the light engineering industries, this phase is well advanced; in the heavier industries it has little more than begun. And finally, the metallurgist, producing new alloys to give lighter and stronger structures, obtains a double advantage by making them weldable. This phase is only now commencing."

It is evident that the situation Sir Alexander thus describes in England is closely paralleled in the United States. In searching for reasons why progress in welding is not more rapid in this country the outstanding one appears to be the difficulty of getting new capital for investment in industrial equipment of this class. Thus, while large amounts of steel mill equipment have been bought and installed, a very negligible amount of new capital has been invested in equipment for the production of such machinery. Also, there have been substantial purchases of machine tools for manufacturing industry but very small purchases of the equipment with which machine tools are made.

In contrast to this situation the field of rolling stock for railroads shows that with rather modest purchases of cars and locomotives, there have been large purchases of equipment to manufacture the products and these purchases have been along the lines of welding equipment and equipment used incident to welding. This industry has passed through all of the stages Sir Alexander describes and is on its way to large prosperity in the future. The time appears not far distant at which many other industries will pass through the same evolution which will mean great prosperity for all of the welding industry.

Builds Versatile Unit

■ **Using a P&H-Hansen Smootharc welding generator, this portable, engine-driven welder was fabricated by Roselle's Inc., Miami, Fla., welding shop. A receptacle also accommodates a standard electric drill or grinder**

Welding Volume Is Great

■ While 1937 production of stainless steel cannot be predicted as this is written, the purchase of welding equipment and stainless steel welding rods during the year has been of such volume as to indicate that all records will be broken. Significant from the welding point of view is the fact that practically all fabrication of stainless steel is by spot welding or arc welding. No small part of the successful results in fabrication of stainless sheets and thin plates is due to perfection of the Shotweld process with recording tape which shows the quality of each spot weld as it is made.

New Metal Products

United Co., Westminster, Md., is manufacturing a new corn husking machine known as the Tuc. Nickel cast iron is used for bases, debutting frame, alignment bracket and drive, gear case knife and vertical drive shaft housing, lower butt chutes and bearings.

♦

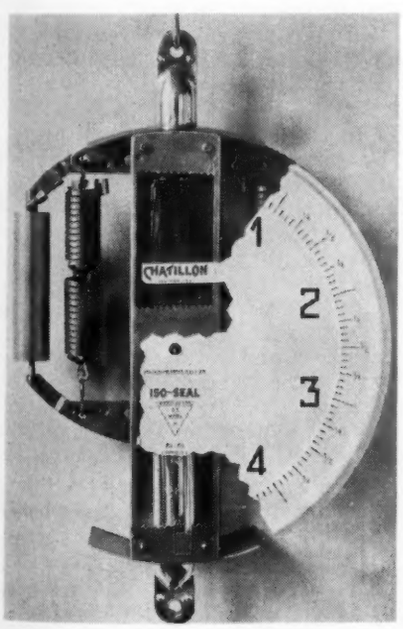
Emerson Electric Mfg. Co., St. Louis, has announced a new overlapping blade oscillator fan on an adjustable floor stand. Blades are of highly polished aluminum while cast iron base and other parts of steel are finished with rich mahogany lacquer.

♦

Chase Copper & Brass Co., Waterbury, Conn., is marketing an electrical grounding rod. Unit consists of a copper tube with a steel-pointed shank on the end which is driven into the ground. A driving rod, longer than the tube, extends down through the copper tube to the shank. When tube is driven into ground, driving rod is removed and top of tube stopped up with a brass plug.

♦

John Chatillon & Sons, 85 Cliff street, New York, has placed on the market a scale with Iso-Elastic



springs, immune to temperature changes, and with dials on both front and back. Essential parts are made of rust and corrosion resisting material, pinions being of stainless steel and enclosed in a brass housing having bronze bearings. Racks are also of bronze.

♦

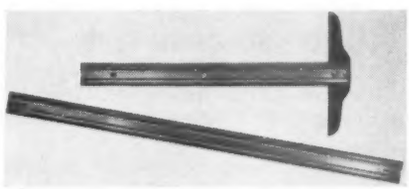
International Nickel Co., New York, has announced a new Monel metal sheet, designated as No. 35 and claimed to be harder and more resistant to denting and scratching than previous sheets of the same material. Designed particularly for use in food service equipment, sheets can be bent, formed, soldered or welded.

♦

Buffalo Fire Appliance Corp., Buffalo, has developed a one-quart fire extinguisher with forged brass pump handle, brass nozzle and housing of seamless drawn brass.

♦

Turner Devices Inc., St. Louis, is manufacturing T-squares and other drafting equipment of stainless steel because of its rigidity and rustproof, permanent and nonwarping qualities. Thin cross-section gives convenience, and the rounded bearing-surfaces, extending the length of the blade, will not scratch



or soil the work. Permanent straightness of the edges is also insured by stainless steel.

♦

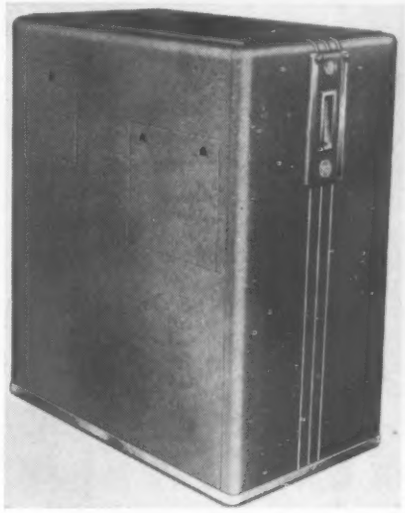
D. B. Smith & Co., Utica, N. Y., has announced the E-Z knapsack sprayer for all spraying purposes such as gardens, trees, whitewashing, disinfecting, firefighting and spraying oil solutions. Nozzle, pump and carrying handle are brass and 5-gallon tank is copper bearing galvanized steel or solid copper.

♦

Gray Marine Motor Co., 6910 East Lafayette avenue, Detroit, has announced 26 sizes and models of Gray marine motors in its 1938 line, each specifically designed and equipped for a certain type of service. A highly corrosion-resistant, close grained nickel-chrome-iron alloy is used in the cylinder blocks and heads.

♦

York Ice Machinery Corp., York, Pa., has developed an oil-burning boiler, especially designed for operation in domestic heating or as an integral part of a complete residential air conditioning system. Boiler is of sectional construction and combines advanced principles of extended cast iron heating surface and matched oil burning efficiency. Jacket is of heavy gage furniture steel, finished in luminescent gray, with stainless steel trim and base molding. Unit was styled by



Walter Dorwin Teague, industrial designer.

♦

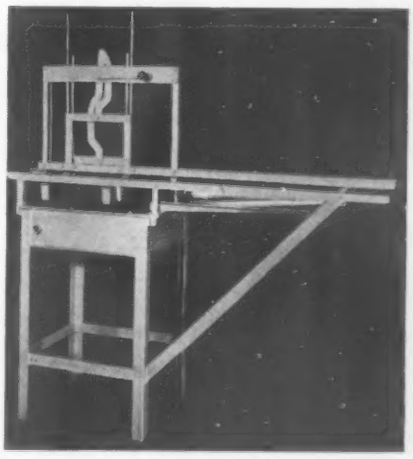
Marlin Firearms Co., New Haven, Conn., has as its most recent development a new over and under shotgun. The new model is a takedown, hammerless gun with barrels of Marlin special steel. Unusually strong frame construction is of Hi-Tenso steel.

♦

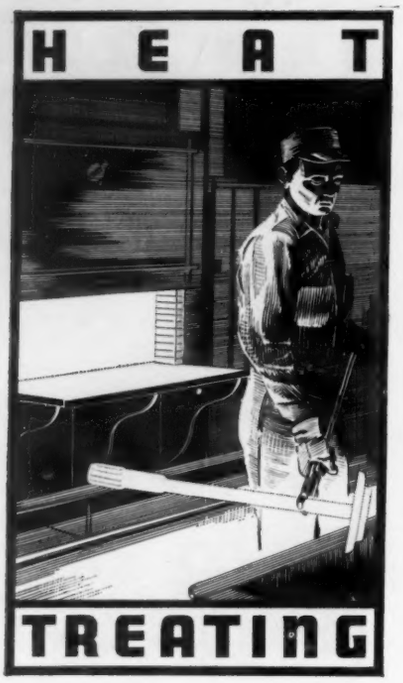
Geerpress Wringer Inc., Muskegon, Mich., has announced a new and efficient mopwringer with all metal parts processed for rust resistance by plating. Mechanism is of stamped steel parts while tub is heavy galvanized sheet.

♦

Thomas S. Gassner Co., Philadelphia, has built a machine for putting the chocolate covering on ice cream bars by dipping them, a unit of use in dairies and other plants making ice cream products.



Fabricated entirely of stainless steel, an advantage is its sanitary qualities.



Plow Shares

Pack carburizing method is employed to obtain deep, case-hardened wearing surfaces and cutting edges while leaving core of plate soft and tough

By C. A. ANDERSON
Factory Superintendent,
Minneapolis-Moline Power
Implement Co.,
Moline, Ill.

■ FACILITIES for the manufacture of plows at the Moline, Ill., plant of Minneapolis-Moline Power Implement Co. include carburizing and drop hammer forming and welding equipment.

Many of these plows are designed to be used as a unit with MM Twin City tractors manufactured by the company. The change from horse and mule to power farming has necessitated many changes in the manufacture of farming implements, particularly in design, types of steels used and their heat treatment.

Steels for shares and moldboards, the most important parts of a plow, are carefully specified and heat treated. In the production of MM shares and moldboards, SAE X-1015, fine grain, steel plate with 0.10 to 0.20 per cent carbon and 0.70 to 1 per cent manganese is used. This is carburized in plate form before used in fabrication of the equipment.

Carburizing treatment involves rather unusual handling and packing procedure. The SAE X-1015 steel is received in 8-foot plates 11 to 17 inches wide and ¼, 5/16, or ⅜-inch in thickness. For carburizing, these sheets are packed on edge in wooden boxes with ½-inch sides. Five steel plates in the bottom tier are separated with ⅜-inch rounds and carburizing material is carefully packed in below and between sheets to leave no air spaces.

A layer of carburizing material is placed on top and another tier of five sheets similarly packed with carburizing material and spacers. Each tier is covered with a layer of carburizing material and the wooden top nailed on. This makes approximately a 1000-pound charge. A test bar of the same material is also packed in the box.

The entire box is loaded into the carburizing furnace by an electric hoist on a monorail. The box is set on a long charging channel with rollers and pushed into the furnace so that the box rests on a layer of carburizing material. While the box is held in position, the charging channel is withdrawn.

Space around and above the box is then entirely filled with carburizing material and the door closed. The purpose of the box is to assure better packing and easier handling. It is entirely consumed during carburizing.

Muffle Type Furnaces

Furnaces are of the muffle type with eight staggered natural-gas burners above and below to insure uniform temperature. Temperature is maintained within 10 degrees of 1700 degrees Fahr. by automatic control units. The steel remains in the furnace for 22, 24, or 26 hours, depending on thickness of plates. Pyrometer chart records are made on each of the furnaces as a check on supervision and operation of each shift.

Plates are removed one at a time with long tongs and quenched in water until they reach a temperature of 900 degrees Fahr. The 10 plates from each muffle are then placed in an annealing furnace,

Turning under stubble and breaking soil, the first steps in preparing for the next crop. Plow share and mold board must be designed for type of soil and speed of plowing

brought up to 1350 degrees Fahr. in about 1 hour, and allowed to remain at this temperautre for 1½ hours.

Then they are removed and rolled hot to straighten. Machinability of the plates is insured by holding the temperature of the annealing furnace close enough to the critical temperature of the carburized plates to permit air cooling without hardening.

This process carburizes the metal one-third the depth from both sides, leaving a soft center. When drawn down to a cutting edge on the shares, there is a soft center reinforcement a short distance back from the sharpened edge, which strengthens and prevents breakage in use.

Remaining Material Utilized

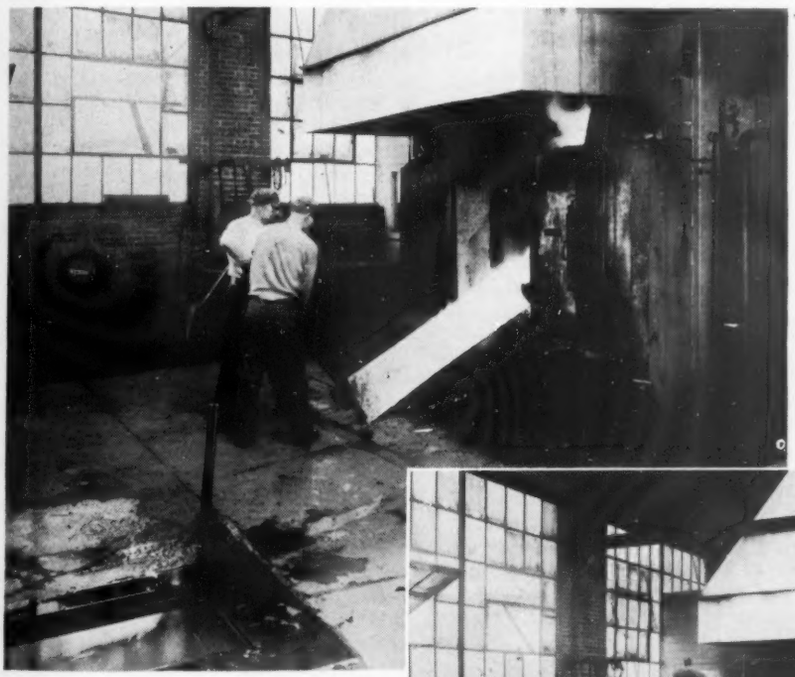
The carburizing material remaining in the furnace is drawn, additional new makeup material added and reused in a subsequent charge. It is screened periodically to remove dust and foreign material.

About 35 operations are required in the production of a plow share composed of 4 pieces, drop-hammer welded. To provide a high-grade cutting point on the share, pieces of SAE 1095 high-carbon steel, 0.90 to 1.05 per cent carbon 0.25 to 0.50 per cent manganese, are welded on the top and on the bottom, the points which receive the greatest wear. These pieces of high carbon steel are first electrically spot welded to the adjacent parts to assure correct position. This assembly is reheated to 2400 degrees Fahr. for the landside and 2100 degrees Fahr. for the plate and die welded in a drop hammer.

After face of the share is ground it is heated to 1450 degrees Fahr. and quenched in 15 per cent brine maintained at 40 degrees Fahr. During the cooling process the share is held in a press under clear running water to prevent distortion. The edge is tempered to proper hardness to maintain a good cutting edge and to protect against breakage in the field caused by coming in contact with rocks and other obstructions. In a final operation, the share is finish ground and polished.

The moldboard is shaped and cooled in a press after heat treatment to prevent distortion. It is hardened to 63 to 65 Rockwell C hardness. The face is ground and polished so that it will "scour" in use; that is, so that the soil will slide off and not stick to the surface. Incidentally, it was the desire to get a moldboard that would scour in the heavy prairie soils of the Middle West that first led to the use of steel plows. Present-day plows are constructed almost entirely of steel.

Charging carburizing furnace with steel plates boxed with carburizing material



After 24 hours in furnace, plates are removed with tongs as shown above. Immediately upon removal, as shown at right, plates are water quenched in the floor tank, subsequently they are annealed at 1350 degrees Fahr., rolled to straighten and air cooled

NEW EQUIPMENT

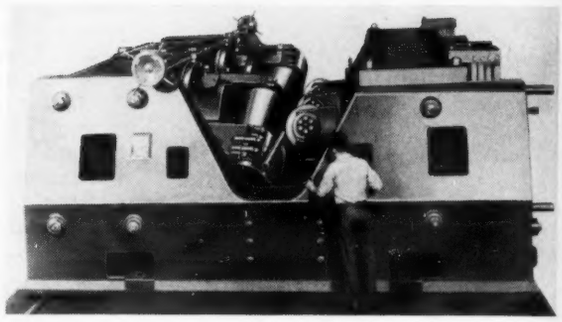
Builds Telescopic Industrial Truck

■ Mercury Mfg. Co., 4118 South Halsted street, Chicago, has added to its line a new industrial truck of center control type, a unit with two wheel front wheel drive and rear two wheel steer.

This model is built in four wheel base sizes, 50, 54, 60 and 66 inches, respectively. The 66-inch size has a maximum capacity of 10,000 pounds on 36-inch long forks. Machine is of telescopic lift type with hydraulic actuation of fork elevation. Forks will travel from a lowered position of 1¾ inches above the ground to a height of 107 inches. Telescopic fork elevation to a height of 144 inches is possible, or the truck can be equipped in the high or single lift type with fork elevation to a maximum height of 57 inches.

Forks are adjustable center to center, adjustment being accomplished through use of demountable crank, which moves forks by means of a rack and pinion arrangement. Permanently spaced forks with rigid load back rest can also be applied. Drive axle is of double reduction spiral bevel and spur gear type. Steering mechanism is of the Ross cam and lever type, and steering control is by means of a horizontally disposed wheel.

Battery power assembly is housed in a demountable box compartment permitting quick removal and replacement of power source. Truck will accommodate either battery box compartment or gas-electric power source. The new truck has a speed of 5½ miles per hour when lightly loaded and 5 miles per hour with a full load.



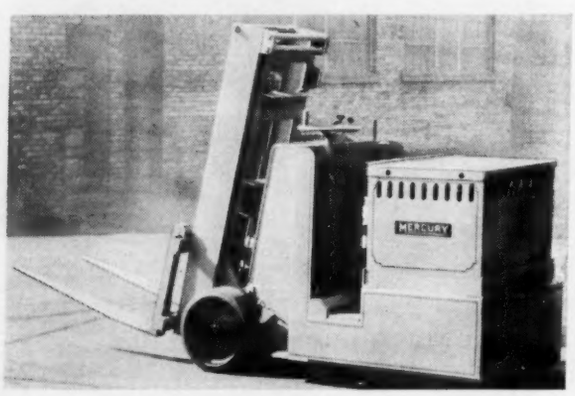
This Sutton-Bigwood 5-B bar and tube straightening machine is said to be the largest machine of its kind ever built

Makes Large Machine To Straighten Tubes

■ Sutton Engineering Co., Park Bldg., Pittsburgh, has placed on the market a 5-B bar and tube straightening machine which is claimed to be the largest machine ever built for such work.

Angle of rolls is adjustable to maintain full contact on nearly all sizes. It is possible to handle a wide range of sizes due to the end to end straightening which takes place in the cross heads. Machines can be set accurately from record charts. Straightening speeds up to 500 feet per minute are possible.

Machines are equipped with Timken roller bearings and have adjustable side frames eliminating over-hang. These units have a range from 2 to 8½ inches on high tensile steel.



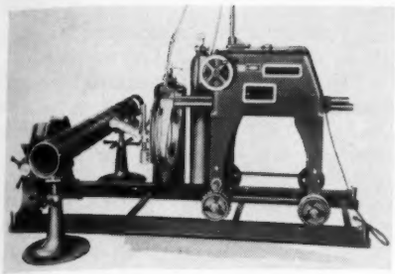
New tilting, telescopic fork truck with which elevation of load to height of 144 inches is possible

Machine Cuts Surface Resembling Lathe-Cut

■ Oster Mfg. Co., 2057 East Sixty-first place, Cleveland, has announced an improved torch cutting machine No. 222, which does not require the use of cams, templates or special fixtures and claimed to produce a surface that has the appearance of a lathe tool cut.

Cutting torch is guided by a mechanism which duplicates motion of torch held in operator's hand. It will cut pipe from 2½ to 12 inches, making tees, reducing tees 90 degrees, branch reducing tees 45 to 90 degrees, elbows, miters and blunt bull plugs as well as hole cutting.

Case containing generating mechanism is mounted on 4 legs which are equipped with flanged wheels running on a track. Pipe is centered in vise and supported on roller pipe rests. When cutting hole in a pipe it is placed at right angles to torch carrier on roller rests. Settings of generating mechanism are regulated



Case containing the generating mechanism of this Oster torch cutting machine is mounted on 4 legs which are equipped with flanged wheels that run on a track

by positioning a rotating beam or lever which operates a reciprocating slide. Beams are marked to show settings for various sizes and types of cuts.

Reciprocating slide controls movement of oscillating lever which reproduces movement in torch carrier. Rotating lever is actuated by a hand wheel located at side of generating mechanism case which also produces drive for rotating torch carrier ring around pipe. Operating hand wheel is located so operator can observe work. Machine weighs 3000 pounds.

Meter Determines Presence of Gases

■ Mine Safety Appliances Co., Braddock, Thomas & Meade streets, Pittsburgh, has recently placed on the market a pocket-sized explosimeter that quickly determines the presence of combustible gases.

Meter is a small compact instrument about the size of a camera and can be carried about either in a pocket or on a shoulder strap. It requires only the adjustment of a single control and operation of a piston-type pump before it is ready for action.

Gas concentration is read on the glass enclosed indicating meter and is claimed the sensitivity is such that gas concentrations below lower explosive limit can be recorded.

Gas sample flows over a hot platinum wire which forms a part of a balanced electrical circuit, current for which is provided by a small two-cell dry battery. Detector unit is balanced against the filament of a small electric light bulb burning in an inert atmosphere. Combustion of gases on the surface of detector filament creates an increase in the temperature of the wire and consequently an increase in its resistance, causing the electrical circuit to be unbalanced. This unbalancing causes a deflection of the pointer of the meter, proportional to the concentration of gas in the atmosphere being tested.

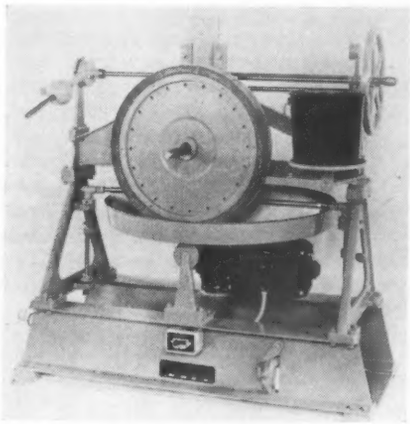
Besides being used in mines, the instrument has been found useful in distilleries, oil refineries, paint and varnish factories, disposal plants and in checking manholes and fire hazards.

Abrasive Applied Evenly and Rapidly

■ Divine Bros. Co., Utica, N. Y., has placed on the market a polishing wheel heading machine that applies abrasive evenly and rapidly on wheels ranging from 8 to 20 inches in diameter.

Cover plate prevents any glue or cement being accidentally dropped into abrasive pan. After glue is applied and cover plate returned back into position wheel is then lowered into the moving abrasive pan by pushing back pawl lever. If more pressure is desired than that furnished by the wheel and the slide, a weight lever is pulled forward and acting through the rack and pinion the back of the slide exerts extra pressure.

Lever is graduated so that amount



Polishing wheel heading machine is powered by a 1/3 horsepower alternating current repulsion motor driving through bronze reduction gear running in oil

of pressure is not left to guess work. Abrasive pan revolves 24 revolutions per minute so that in less than 3 seconds wheel is completely coated. Two scrapers keep the abrasive pan in a smooth, level condition. One scraper is set a little higher than the other, thus when the former ceases to back up grain operator knows that more grain is needed.

After wheel is finished it is lifted out of pan by a revolving hand wheel. Each size grain should have its own pan as changing only requires a few seconds.

Records As Touched

■ Simplex Time Recorder Co., Gardner, Mass., is introducing an electrical recording machine that automatically records time as hand holding time card touches electric registering plate.

Machine is enclosed in a steel case with Baketex wrinkle finish and chromium plated trimmings. Clock is located on top of machine. Below clock and just back of card slot is the electric plate that carries the impulse that causes the time to be recorded.

Elimination of levers and knobs makes the machine tamper proof and free from snagging onto factory trucks, causing serious damage. It is claimed that 100 men can register in less than 2 minutes.

Electrodes Are Versatile

■ American Murex Corp., 120 Broadway, New York, has developed two electrodes which are used for general shop work where positioning of parts during welding is not practical and also useful in structural welding including shipbuilding, bridges and other building construction.

Vertex electrode is a reverse polarity rod designed for welding mild steel in flat, vertical and overhead positions, while the Genex electrode is an all around type that may be used in all positions and claimed to readily bridge gaps between plates where assembly fit-up is poor. It is a straight polarity unit.

Welder Is Economical

■ Borm Mfg. Co., Elgin, Ill., is marketing a new, easy operating alternating-current arc welder said to operate as easily on thin metal as on heavy.

This welder will handle 1/16 to

This Borm welder will handle from a 1/16 to a 3/16 inch rod and operates as easily on thin metal as on heavy

3/16-inch rod. It is claimed that power company tests have shown the operating cost to be approximately five cents per hour.

Built in a nonmetallic case and mounted on rollers, it can be carried or moved about easily. It has twelve heat ranges and is so designed that no training is required for operator to select the desired heats. Arc is said to be so flexible that practically any mechanic can hold an arc with it.

Portable Cleaner Gives Hours of Service

■ United States Hoffman Machinery Corp., Air Appliance division, 105 Fourth avenue, New York, has placed on the market a new portable No. 5 vacuum cleaning unit which is said to give many hours of continuous service in removing large quantities of dust.

Dust collector of unit has 3½ to 4 times the storage capacity of an average cleaner. Container is equipped with a raising and lowering device actuated by a crank handle. Device is mounted on a separate set of wheels, independent of those on which the unit is moved. Unit pull-handle can be detached and used to pull the container.

Carrying space is provided on the unit for the hose and all of the cleaning tools and accessories. Unit has sufficient capacity to operate simultaneously two lines of 1½-inch hose of different lengths, or one line of 2-inch hose.

Steel Furnace for Laboratory Purposes

■ American Gas Furnace Co., Elizabeth, N. J., has introduced a steel furnace table which is suited for work in laboratories, small shops and vocational schools.

Forge of furnace has a depth of 4 inches and an entrance 3 x 2½ inches in width which is closed by a swing door. A similar opening, equipped with a plug at the rear, permits inserting long rods for heating at some mid point for bending and shaping. A heat-resisting alloy hearth converts the unit into an oven furnace for hardening, annealing and normalizing. A raw gas burner located between the regular burners controls air supply and acts as a pilot light.

The furnace is also equipped with a pressed steel pot 4 inches wide and 8 inches deep for soft metal melting, lead hardening, cyaniding or other salt bath heat treating. For aluminum melting, a cast iron pot is provided inside the furnace and is covered by a refractory cover with band and bail. This pot is 4½ inches wide and 7 inches deep. Steel table itself is 2 x 4 feet and has a shelf at the bottom for tongs. Small blower powered by a motor is supplied with the furnace.

Hum from Contactor Is Eliminated Now

■ General Electric Co., Schenectady, N. Y., has placed on the market a new line of alternating current contactors which will not hum during operation as closing magnets are operated by direct current.

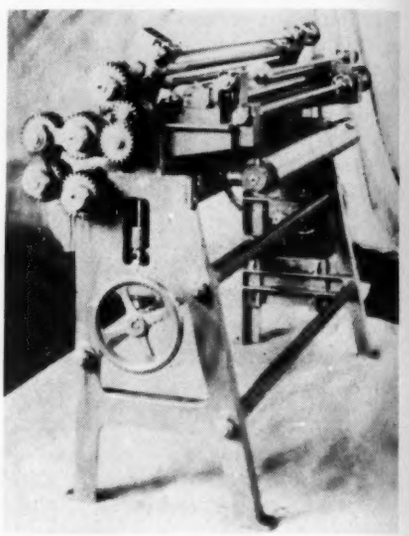
Contact tips of contactors are made of heavy copper and designed to minimize arc burning. They open and close with a combined rolling, wiping motion which keeps the contact surfaces clean, minimizing tip resistance, heating and reducing the possibility of the circuit opening because of the effects of pitting or corrosion. Current is always carried at a different point from the one at which circuit is made. A heavy, steel spring maintains a constant pressure on the tips to minimize contact resistance. Tips are easily removed.

Contactors are furnished with restricted type arc chutes which cool and confine arc. Armatures and magnet frames of control devices are self-aligning. Solid direct current construction is used. Steady pull is exerted on the armature to close the main tips and to eliminate vibration and pounding of magnet face.

Coils are assembled with insulating paper on magnet frames which are securely clamped to prevent chafing. Contactor shaft is covered with a heavy insulating material and supported by large bearings. All metal parts are cadmium-plated.

Machine Coats Sheets

■ Charles E. Francis Co., Rushville, Ind., has introduced roll coating ma-



Roll coating machine is also used for oiling sheets for draw press operation

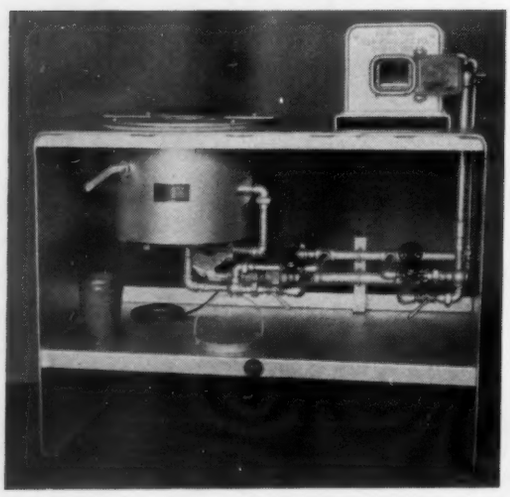
chines which are used to coat one or two sides of metal sheets, strips and punchings.

Machines are said to be built for a variety of purposes. They may be used for oiling sheets for draw press operations as well as for paint, lacquer, enameling and other finish.

Makes Filing Plates

■ Murcott & Campbell Inc., 286 Union avenue, Brooklyn, N. Y., has developed file plates which are used on small parts where true and accurate surfaces are required.

Files are made in widths varying from 1½ inches to 8 inches. They may be obtained from 6 to 24 inches in length and from 1½ to 1¼ inches thick. Operator holds piece to be filed in his hands and passes it over the surface of the file plate. Some uses for which file plates are now used include filing slide valve parts on locomotive and passenger car air brakes, fitting piston to crankshaft of automobile truck engines, bronze bushings on power pumps and small die-cast

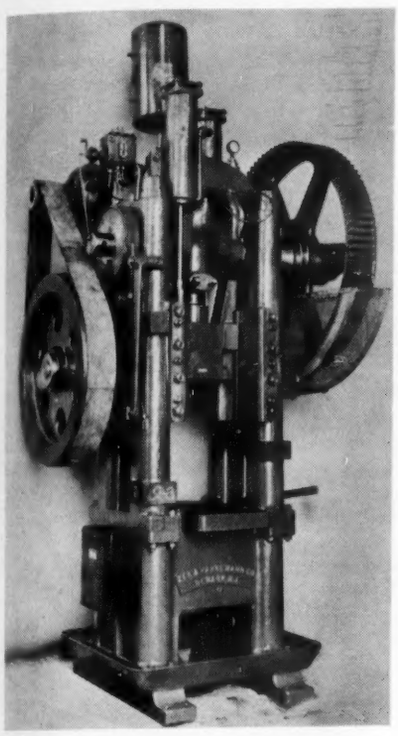


Furnace built by American Gas Furnace Co., has a steel table top and is equipped with a heat-resisting alloy hearth which converts it into an oven furnace for hardening, annealing and normalizing

parts where vise filing is not practical.

Side Press Is Built of Tie-Rods

Zeh & Hahnemann Co., 182 Vanderpool street, Newark, N. J., has announced a new design of a



Operating speed of this Zeh & Hahnemann side press is approximately 50 strokes per minute. It has a capacity of 75 tons

straight side press with a single crank and a capacity of 75 tons.

Press is constructed of built-up tie rods. Maximum stroke of press is 12 inches. Bed area, front to back, and right to left is 20 x 19 inches. Balancing cylinders for the slide, force feed lubrication, roller bearings, individual motor drive, oil pan and pump are some of the press equipment. Press weighs 5½ tons with the motor. Overall floor space is 59 x 53 inches. Operating speed is approximately 50 strokes per minute.

Dredge Pumps Improved

■ Morris Machine Works, Baldwinsville, N. Y., besides improving its line of dredge pumps, has introduced type K which also functions by hydraulic action.

Seals have been eliminated from the suction side of this pump. It may be driven by either a direct connection or belt drive, and is said to be suitable for heads up to 100 feet. It is also claimed to be 60 per cent efficient.

Simple suction entrance, balanced pressure around the shroud, eliptical shape of shell sections, distribution of metal in the shell, location of liners and heavy shaft and bearings are included on some of the features of pumps type F and H, which are manufactured for larger producers.

Complete revamping is also found in the accessory field. Welded steel bases have been substituted in the dredge hoist. Arrangement of drums and bearings have been changed to prevent mounting of more than one drum a shaft.

Cleans and Dries In Three Operations

■ Detroit Rex Products Co., 13005 Hillview avenue, Detroit, has introduced a three-dip, hand-operated degreaser which cleans and drys machinery in a few minutes.

Machine consists of boiling chamber, rinse chamber and vapor chamber separated by wide dams which act as heat insulators. Arrangement of chambers permits a straight line sequence of cleaning operations.

Work is placed in large perforated baskets and lowered into boiling solvent where the heavy contamination is removed. Boiling solvent flows over the work giving a washing or scrubbing effect that assists in the removal of solid particles.

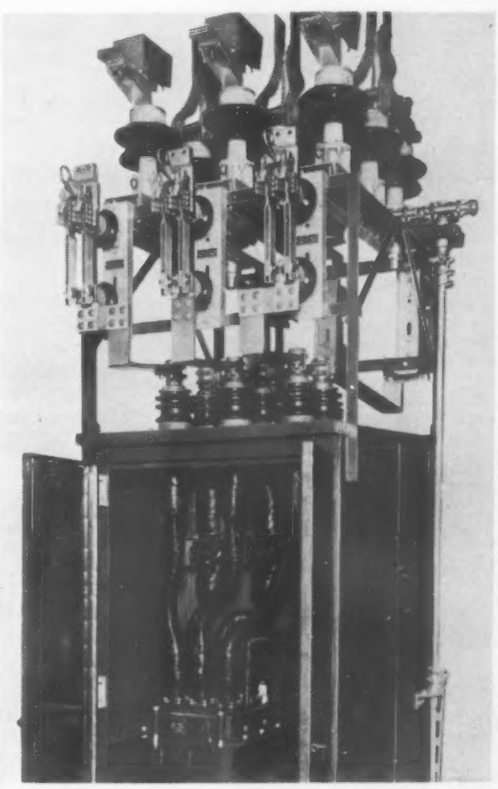
In the second chamber solvent temperature is lower than that of the boiling chamber and vapor chamber. Temperature difference is maintained by open air space in the dams separating chambers.

Immersing work in the cool rinse lowers its temperature and flushes off work. Final cleaning, reheating and drying are effected by placing work in the third or vapor chamber. Water jacket and solvent collecting trough completely encircle machine. Vapors which condense at the level of water jackets are collected in the trough and returned to rinse chamber. Arrangement insures a continuous supply of clean solvent condensate for rinsing.

Machine is equipped with a vapor actuated, air-operated control system consisting of thermostat temperature indicator and valve which regulates heat input and height of vapor column. Constant solvent level is maintained in chambers by a motor-driven transfer pump which returns overflow to boiling chamber. Pump is also used to transfer solvent from one chamber to the other when cleaning unit or distilling solvent. Units are available which employ gas or electric immersion heaters as the heating medium.

Weatherproof Housing Encloses Circuit Breaker

■ Delta-Star Electric Co., 2400 Fulton street, Chicago, has introduced a weatherproof switchhouse which encloses a 15-kilovolt, 2000-ampere, oil-blast circuit breaker with instrument



Delta-Star weatherproof switchhouse encloses a 15-kilovolt, 2000-ampere, oil-blast circuit breaker and all its equipment

transformers and panel equipped with control switch, indicating lamps, instruments, relays and test switches.

Primary connections are brought out through a nonmagnetic roof supporting sealed type roof entrance bushings. Six vertical mounted hook stick switches serve to disconnect the circuit breaker from the line. Horizontally mounted three pole switch on top of framework and operated from ground level by-passes the equipment insuring continuous service during testing and inspection periods.

Welder Is Powered By Gasoline Engine

■ Hobart Bros., Troy, O., has announced a new junior model 200 ampere, gasoline engine-driven, arc welder which is claimed to be useful for installation on light, emergency service trucks.

The welder is completely equipped and built on steel skids with canopy enclosure and hinged side panels that fold over the top and lock. Equipment includes electric self-starter, battery ignition with generator, built-in fuel pump, air filter, fuel filter, variable speed governor and sectional steel radiator. Welding generator is provided with remote control, polarity switch, built-in exciter and dual control.

Lathe Has Steel Base

■ Crown Rheostat & Supply Co., Chicago, has introduced a new polishing lathe with a 14-inch overhang from the center of the spindle to the front of the base, providing greater freedom in handling work.

Base of lathe is of welded steel construction. Spindle and motor, due to their positions, are easily accessible, the former by removing a steel guard. These lathes are available from 2 to 15 horsepower.

Crown Rheostat polishing lathe has a 14-inch overhang from the center of the spindle to the front of the base

Blasting Machine Cleans Without Injuring Parts

■ American Foundry Equipment Co., 555 South Byrkit street, Mishawaka, Ind., has placed on the market a new type Wheelabrator Tablast blasting machine which is claimed to clean small fragile articles without scratching or injuring them in the process.

Machine consists of a number of independent tables, number and diameter of which can be varied. Tables are mounted on a spider which carries them directly under the blast zone. Motor-driven steel disk contacts the tables, rotating them eight times to each foot of travel. All work to be cleaned is exposed full to the blast as tables carrying it turn constantly while in the blasting zone.

Unit throws abrasive by centrifugal force. Hair lines, cracks and minute defects in products being cleaned are completely exposed and it is claimed a brilliant finish is attained.

Abrasive cycle is automatic. After abrasive is thrown from the wheel it drops into a tapered hopper which feeds into the boot sections of an elevator. Boots discharge by gravity into a rotary screen where useless fines are removed. Clean abrasive then gravitates into a storage hopper and subsequently into the blasting machine through a valved control. Abrasive is reused until reduced to a metallic dust which is sucked out of the machine by the dust collector.

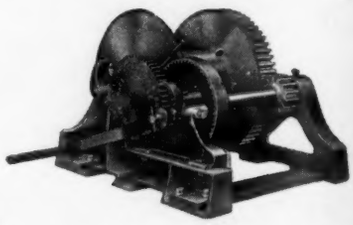
Speed reducer varies speed of work through blasting area and prevents the possibility of over and under-blasting. Finish desired may be obtained by using the proper size shot or grit and adjusting speed of machine for correct blast exposure.

Cabinet is fabricated of heavy, steel plate and reinforced. Front half is cut away so operator can load outside of blast area. Opening is baffled with rubber curtains to prevent loss of flying abrasive. Dust seals are provided throughout machine.

Hoist Has Three Speeds

■ Beebe Bros., 2724 Sixth avenue, Seattle, has placed on the market a 15-ton triple-geared hoist for heavy duty which is claimed to withstand 100 per cent overload.

Hoist has three speeds ranging from 4 to 1, 19 to 1 and 109 to 1. It is equipped with a gear change working head and an internal cam action brake similar to one used on the 5-ton hoists. Brake is on a 19 to 1 ratio. Drum shaft which is

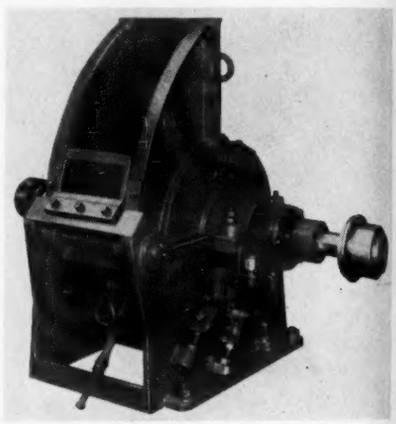


Free spooling is instantly available on a 4 to 1 ratio with this Beebe 15-ton triple-geared hoist Special

3 3/16 inches in diameter is bronze bushed and anchored at each end to side frames. Shaft may be used as a spacer bar. Gear overhang of the unit is 2¼ inches. Unit weighs 680 pounds.

Hogs Are Improved

■ Mitts & Merrill, Saginaw, Mich., has recently introduced a new series of hogs, No. 12-C, which are used to reduce combustible rubbish in factories.



This hog, fabricated of steel by Mitts & Merrill, grinds up factory waste material and reduces it to small particles

Machines are of all steel construction and are equipped with extra large shafts and oversize roller bearings to withstand any service that may be encountered in this type of work. They are also equipped with safety devices which throw out any large tramp metal without injury to the hog.

Units are built with two types of cylinders. The shear blade type handles combustible refuse of all descriptions containing nails and band iron. The flat-faced, sharp knife type is efficient for grinding wood waste and paper stock, it is claimed. If desired, machines can be furnished with screens to control the size of the reduced material.

Making Motors

(*Concluded from Page* 52)

bays along the north side of the building served by one 3-ton and one 2-ton overhead traveling hoists in the light motor bay with one 5-ton and three 2-ton traveling hoists over the heavy motor section. On the smaller hoists, electric power is employed only for hoisting, hand chains being used for movement lengthwise and crosswise the bay permitting precise spotting of frames into fixtures which in turn permit frames to be rotated as coils are inserted, thus facilitating this operation.

Crane layout over the assembly and test departments is rather unusual in that three levels are employed. The two runways carrying the six cranes in the winding department mentioned above extend over a portion of the assembly department. The 5-ton cranes completely powered operate on a single runway just above the two runways from the winding department. Assembly department cranes operate over part of the test floor as well, extending under the runways carrying the 15-ton crane which serves the testing, shipping and unloading sections. This runway forms the third and highest level. All three runways are shown in accompanying illustrations. This provides the flexibility so essential to efficient handling of the wide variety of work in assembly and on test.

Small motors and generators are handled on roller gravity conveyors with stations for assembling, testing, finishing and crating.

Castings for such parts as bearing caps, motor end brackets and rotor spiders are received at the west end of the building, accumulated in large skid boxes and carried by electric truck to the machine department where short hauls, such as between machines, are handled by hand trucks fitting these same skid boxes. Small parts are handled in metal tote boxes.

No materials are moved in any portion of the building without an order from one of two "nerve centers" located in two central portions of the plant, one near the shafting aisle and the other near the machine shop. This fixes responsibility for placement, enables movement of parts to be synchronized wherever this is possible and facilitates organization of this work.

Conveyor lines, storage centers and layout of machines and work positions are constantly under revision to meet changing production requirements. The trend here is toward more even distribution of work done at the various work positions thus producing a more uniform flow of materials through the plant. Handling systems to keep materials at working height are being installed wherever possible. An example is the recent installation of the gravity roller conveyor line in the small motor frame fabricating aisle. Used in conjunction with a series of welding fixtures, a setup has been produced which increases efficiency in that higher production is obtained at lower cost.

Controls Safety Grit

■ A sander that consists of a valve operated by vacuum to control the distribution of safety grit has been introduced by Westlake Mfg. Corp., Canastota, N. Y. Unit gives year around service.

Installations can be made on all types of trucks, tractors, trailers or busses. A constant supply of heat is circulated through the unit to prevent ice and snow from clogging it. Tanks holding the grit are built to suit conditions.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

• Cleveland Tramrail Cranes and Transfer Bridges are serving hundreds of machine and forge shops, tool rooms, etc. This one is equipped with a floor controlled electric hoist.

• Tramrail is a Pace Maker to Production — bringing up stock and removing finished product as fast as the machine requires. A safe Aid to increased production — it helps men to avoid the heavy and hard to handle lifts.

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

Division of

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Carboloy Dies—Carboloy Co., Detroit, has available two publications, price list D-37 and carboloy die manual DS-711. The latter embodies 12 pages of descriptions and engineering data about rough cored and blank dies.

Furnaces—Surface Combustion Corp., Toledo, O., has released bulletin form No. SC-84 entitled, "Furnaces for Agriculture and Road Equipment." The bulletin contains illustrations and some engineering data.

Thermometers—Foxboro Co., Foxboro, Mass., has released bulletin 198-1 containing 40 pages of illustrations, descriptions and engineering data concerning recording thermometers. A brief story on the value of thermometers introduces the contents.

Pyrometers—Brown Instrument Co. division of Minneapolis-Honeywell Regulator Co., Wayne & Roberts avenues, Philadelphia, has issued a 6-page folder 84-9 entitled, "Legibility Plus Precision." The folder is printed in 7 colors reproducing the colored numeral records as printed on the chart of pyrometer recorders.

Precision Lathes — South Bend Lathe Works, 520 Niles avenue, South Bend, Ind., has published a new 1938 catalog No. 46. Catalog contains 24 pages of illustrations, specifications and engineering data covering the company's line of precision lathes.

Refrigeration—Ingersoll-Rand Co., 11 Broadway, New York, has issued a 32-page catalog describing the development and installation of centrifugal type water-vapor refrigeration units. Illustrations and engineering data are also included.

Power Tools—Double A Products Co., 405 North Fifth avenue, Ann Arbor, Mich., has released a 6-page circular illustrating and describing its complete line of power tools and accessories. Engineering data are included.

Electrical Heating — Harold E. Trent Co., 618 North Fifty-Fourth street, Philadelphia, has issued two leaflets showing its latest line of immersion units for applying electrical heat to liquids, waxes and some compounds. Included in the leaflets are illustrations and engineering data.

Information Index—International Nickel Co., 67 Wall street, New York, has available an information index listing current literature on production and industrial applications of nickel alloy steels, nickel cast irons and nickel alloyed nonferrous castings.

Ventilation—H. H. Robertson Co., 2000 Grant building, Pittsburgh, has published an interesting bulletin on its method of providing ventilation for foundries. Drawings show results to be obtained through the application of the method employed by the company. Service information and features of the Robertson way are given, including control of ventilation, daylighting and maintenance and replacement.

Zinc—New Jersey Zinc Co., 160 Front street, New York, has published two bulletins, one entitled "Zinc Alloy Die Castings in Electrical Equipment," and the other, "Zinc Alloy Die Castings in Business Machines."

Sand Mixing Machines—Beardsley & Piper Co., 2541 North Keeler avenue, Chicago, has published a folder on its speedmuller for mulling, facing, backing or compound and oil core sands. Information is presented on details of construction.

Blast Cleaning—American Foundry Equipment Co., 532 South Byrkit street, Mishawaka, Ind., has published a small booklet entitled "Wheelabrator Roll Call." In addition to a list of users of blast cleaning equipment, illustrations show typical installations.

Thermometers—C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y., has issued a catalog on industrial thermometers. Information is given on construction of the instruments and a wide variety of applications.

Gears—Foote Bros. Gear & Machine Corp., 5301 South Western boulevard, Chicago, has released bulletin 601 entitled "IXL Agitator Drives." The bulletin contains complete ratings, specifications and other engineering data concerning IXL type AD vertical agitator drives. Application views are included.

Steel Plates—Worth Steel Co., Claymont, Del., has compiled a new 32-page catalog No. 101 containing illustrations, engineering data and specifications concerning sheared steel plates.

Plating Solutions — Hanson-Van-Winkle - Munning Co., Matawan, N. J., has compiled a 24-page, paper bound booklet containing methods of analyzing plating solutions in practical operation as used in the company's laboratories. A list of equipment and laboratory solutions necessary for analysis is included.

Welding Rods—American Murex Corp., 120 Broadway, New York, has issued a new pocket size booklet on some 20 different types of welding rods and the uses for which they are best adapted. Descriptions include Vertex and Genex rods. Booklets are available by addressing Metal & Thermit Corp., 120 Broadway, New York.

Welding—Hobart Bros., Hobart square, Troy, O., has released two bulletins embodying the descriptions of its products. One bulletin contains a description of its gas engine drive, 200 ampere welder and the other of the heavy duty, gas engine drive. Illustrations are used.

Tantaloy—Fansteel Metallurgical Corp., North Chicago, Ill., has published a 4-page bulletin containing engineering data and specifications of Tantaloy tipped tools. Material is a hard alloy containing tungsten, cobalt, and carbide.

Dust—W. W. Sly Mfg. Co., 4700 Train avenue, Cleveland, has published an 8-page booklet describing what dust is and how to overcome its dangers in industrial plants. Problems to be considered in fighting dust are also embodied.

Generators — Janette Mfg. Co., 556 West Monroe street, Chicago, has issued a circular filled with engineering data concerning alternating and direct current generators.

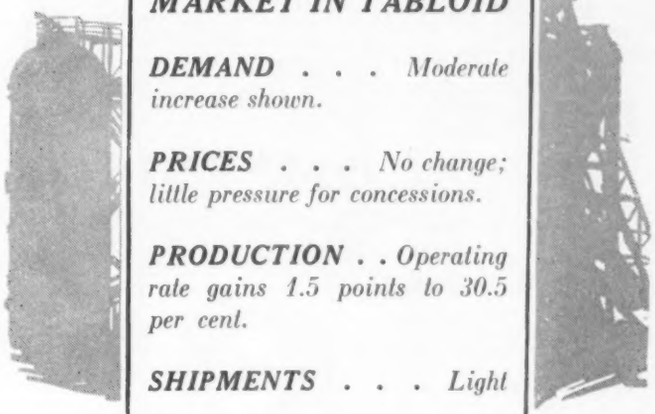
Tanks and Accessories — Haveg Corp., Newark, Del., has released bulletin D-1 embodying engineering data, illustrations, and descriptions of rectangular tanks and accessories.

Forged Tools—Billings & Spencer Co., Hartford, Conn., has published a 48-page pocket catalog featuring engineers' double-end Hex box wrenches, textile, construction and structural wrenches and shop tools. Illustrations and engineering data are also embodied.

Hydraulic Presses — French Oil Mill Machinery Co., Hydraulic Press Division, Piqua, O., has released a booklet containing a record of accomplishment in the development of hydraulic presses and controls. Booklet contains large illustrations and some engineering data.

Improvement in Steel Buying Is Slow

Scrap Rise Pauses; Steel Rate Higher; More Ship Demand



MARKET IN TABLOID

DEMAND . . . *Moderate increase shown.*

PRICES . . . *No change; little pressure for concessions.*

PRODUCTION . . *Operating rate gains 1.5 points to 30.5 per cent.*

SHIPMENTS . . . *Light*

■ SLIGHT improvement in demand for steel continues to manifest itself but not sufficient to indicate a marked change in the position of consumers.

Buying is in small lots and its nature indicates it is for filling gaps in stock rather than for protecting the future. Prompt shipment is asked. Rolling schedules are intermittent, depending on accumulation of small orders. One effect of this condition is to divert some business from mills to warehouses. Jobbers are buying fairly well to meet this demand.

Some steelmakers find January orders slightly better than in December, part of this being attributable to moderate increase in automotive specifications, which are beginning to assume more importance.

Railroads offer little tonnage although small purchases of cars, rails and a few locomotives come out each week. Programs for the year are being held back until the rate situation is made definite. Every effort is being made by the interstate commerce commission to expedite hearings and arguments to the end that a decision may be made in February. Belief is that some measure of relief will be granted and considerable buying is expected to follow.

Shipbuilding continues to pile up a future tonnage of steel which will furnish a backlog over many months. In addition to craft already awarded to builders, who will start soon placing the steel with mills, a number of further projects are pending. Socony-Vacuum Oil Co. will take bids next week on two tankers which will require about 10,000 tons of steel and bids will be opened Feb. 1 on the 12 cargo ships the maritime commission is about to award.

River transportation interests are active in adding to facilities, one located at Pittsburgh having placed ten cargo barges and three fuel flats, requiring 2725 tons of steel. Bids will be taken next month on 22 open hopper barges and a wrought iron hull for a derrick boat for use on the Mississippi and its tributaries.

Continued slight increase in operations at important centers, with unchanged rates at others and only small recessions at two points have brought a net gain of 1.5 points in the national operating rate, to 30.5 per cent of capacity. In most cases expectation is for additional activity during the present week. Pittsburgh moved up 1.5 points to 26 per cent, Youngstown 3 points to 28, Chicago 1 point to 27.5, Wheeling 16 points to 51, Cleveland 2 points to 26 and Cincinnati 4 points to 32. The rate was unchanged at 31 per cent in Eastern Pennsylvania, 23 at Buffalo, 21 at St. Louis and 52 at Detroit. Birmingham receded 3 points to 60 per cent and New England 6 points to 20 per cent.

As a partial offset to the gradual improvement in general buying of steel the agricultural implement industry is curtailing somewhat, a seasonal change. This industry has been one of the sustaining factors over the past several months and its defection is beginning to be felt. However, agricultural areas continue to prosper and renewed buying is expected to bring back production of farm tools shortly.

Automobile production held steady at 65,418, compared with 65,735 in the preceding week. General Motors assembled 21,920, compared with 22,160 the week before; Chrysler output was 11,800, against 13,975; Ford made no change at 22,765; independent builders produced 8933, compared with 6835 in the preceding period.

After a slow rise for seven weeks STEEL's composite of steelmaking scrap prices last week paused and remained unchanged at $13.90. This is $1.15 higher than the low point at the end of November. Export demand in the East is a source of some strength and small offerings prevent a top-heavy market. Holders to a great extent are averse to releasing their material at the present level. The iron and steel composite is also unchanged at $38.97 and the finished steel composite at $61.70.

Because of competition by American steelmakers in world markets the European steel cartel has reduced prices of export steel by the amount added in May last year. General dullness of export demand is another factor in the decision to quote a lower range.

COMPOSITE MARKET AVERAGES

	Jan. 22	Jan. 15	Jan. 8	One Month Ago Dec., 1937	Three Months Ago Oct., 1937	One Year Ago Jan., 1937	Five Years Ago Jan., 1933
Iron and Steel	$38.97	$38.97	$38.93	$38.88	$39.59	$36.55	$28.17
Finished Steel	61.70	61.70	61.70	61.70	61.70	55.80	46.13
Steelworks Scrap ..	13.90	13.90	13.83	13.24	15.93	18.12	6.23

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Jan. 22, 1938	Dec. 1937	Oct. 1937	Jan. 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.20c
Steel bars, Chicago	2.50	2.50	2.50	2.25
Steel bars, Philadelphia	2.74	2.75	2.74	2.49
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.10
Shapes, Pittsburgh	2.25	2.25	2.25	2.05
Shapes, Philadelphia	2.45½	2.46½	2.45½	2.25½
Shapes, Chicago	2.30	2.30	2.30	2.10
Tank plates, Pittsburgh	2.25	2.25	2.25	2.05
Tank plates, Philadelphia	2.43½	2.44½	2.43½	2.23½
Tank plates, Chicago	2.30	2.30	2.30	2.10
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.15
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.80
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.40
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.25

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$57.00	$34.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	34.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	43.00

Pig Iron

	Jan. 22, 1938	Dec. 1937	Oct. 1937	Jan. 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$22.31
Basic, Valley	23.50	23.50	23.50	20.50
Basic, eastern del. East. Pa.	25.26	25.34	25.26	22.26
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	22.21
No. 2 fdy., Chicago	24.00	24.00	24.00	21.00
Southern No. 2, Birmingham	20.38	20.38	20.38	17.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.69	20.69
No. 2X eastern, del. Phila.	26.135	26.21½	26.13½	23.13½
Malleable, Valley	24.00	24.00	24.00	21.00
Malleable, Chicago	24.00	24.00	24.00	21.00
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.04	26.54
Gray forge, del. Pittsburgh	24.17	24.17	24.17	21.17
Ferromanganese, del. Pittsburgh	107.49	107.49	107.29	84.79

Scrap

Heavy melting steel, Pittsburgh	$14.25	$13.40	$17.15	$18.95
Heavy melt. steel, No. 2, E. Pa.	14.00	13.13	14.01	16.40
Heavy melting steel, Chicago	13.25	12.50	13.95	18.25
Rails for rolling, Chicago	15.25	14.25	17.25	19.40
Railroad steel specialties, Chicago	15.75	15.75	19.35	19.65

Coke

Connellsville, furnace, ovens	$4.25	$4.37	$4.45	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.25	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	10.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.31c
Philadelphia, del.	3.40c
New York, del.	3.44c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pac. base pts. f.o.b. cars	3.72½c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.76c
Philadelphia, del	3.85c
New York, del.	3.89c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, f.o.b. cars	2.82½c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	74
Single loop bale ties, (base C. L. column)	63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/4-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 9/32-inch incl.	47.00
Do., over 9/32 to 41/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.63

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25c; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	....	....	....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00		24.50	....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	....	24.66	....
Boston from Birmingham	26.57	....	26.07	....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethlehem	27.47	27.97	....	....
Brooklyn, N. Y., from Bmghm.	27.25	....	....	....
Canton, O., fom Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	....	24.30	....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	....
Cincinnati from Birmingham	23.89	....	22.89	....
Cleveland from Birmingham	24.32	....	23.82	....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	....	....	....
Newark, N. J., from Bethlehem	26.53	27.03	....	....
Philadelphia from Birmingham	25.58	....	25.46	....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	....
Pittsburgh district from Neville Island	∫ Neville, base plus 63c, 76c,) and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	....
St. Louis from Birmingham	†24.12	....	23.82	....
St. Paul from Duluth	26.08	26.08	....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent	126.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	2.00-2.25
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c. l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f. o. b. mill	0.80

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: Spot	Straits Tin: Futures	Lead New York	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Jan. 15	10.87½	11.12½	10.40	42.50	42.75	4.90	4.75	5.00	20.00	13.75	35.00
Jan. 17	10.87½	11.12½	10.40	42.37½	42.62½	4.90	4.75	5.00	20.00	13.75	35.00
Jan. 18	10.75	11.12½	10.40	41.62½	41.87½	4.90	4.75	5.00	20.00	13.75	35.00
Jan. 19	10.50	11.12½	10.40	41.37½	41.62½	4.90	4.75	5.00	20.00	13.75	35.00
Jan. 20	10.25	10.62½	9.77½	41.62½	41.87½	4.90	4.75	5.00	20.00	13.75	35.00
Jan. 21	10.25	10.62½	9.77½	41.25	41.37½	4.90	4.75	5.00	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.50c Conn. copper

Sheets

*Yellow brass (high)	16.87½
*Copper, hot rolled	18.62½
Lead, cut to jobbers	8.25
Zinc, 100-lb. base	10.00

Tubes

*High, yellow brass	19.62½
*Seamless copper	19.12½

Rods

*High yellow brass	12.87½
*Copper, hot rolled	15.12½

Anodes

*Copper, untrimmed	15.87½

Wire

*Yellow brass (high)	17.12½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	5.85-6.00
*Cleveland	6.75-7.00
*Chicago	5.75-6.00
St. Louis	5.50-5.75

Heavy Copper and Wire

*New York, No. 1	7.25-7.50
*Cleveland, No. 1	7.50-7.75
*Chicago, No. 1	7.25-7.50
*St. Louis	7.25-7.50

Composition Brass Borings

*New York	4.85-5.00

Light Copper

*New York	5.25-5.50
Cleveland	5.75-6.00
*Chicago	5.50-5.75
*St. Louis	5.00-5.25

Light Brass

*Cleveland	3.50-3.75
*Chicago	4.00-4.12½
St. Louis	3.25-3.75

Lead

New York	3.62½-3.87½
*Cleveland	3.50-3.75
*Chicago	3.75-3.87½
St. Louis	3.25-3.50

Zinc

New York	2.12½-2.25
Cleveland	2.25-2.50
St. Louis	2.25-2.50

Aluminum

*Borings, Cleveland	6.75-7.00
*Mixed cast, Cleve.	9.75-10.00
Clips, soft, Cleve.	12.75-13.00
*Mixed cast, St. L.	9.50-10.00

SECONDARY METALS

*Brass, ingot, 85-5-5-5, lcl	10.75
Stand. No. 12 alum.	17.00-17.50

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled No. 11	Sheets: Hot Roll Ann. No. 24	Sheets: Galv. No. 24
Boston	4.05c	4.25c	5.25c	3.93c	3.92c	5.58c	4.00c	4.75c	4.85c
New York (Metropolitan)	4.12	4.32	4.32	4.00	3.97	5.60	4.07	4.50	5.00
Philadelphia	4.00	4.10	4.35	3.90	3.90	5.25	4.00	4.65	5.30
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Buffalo	3.90	4.22	4.22	3.92	3.80	5.52	3.97	4.80	5.35
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.16	4.16	3.86	3.86	5.46	3.91	4.66	5.31
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.05	4.25	4.25	3.95	3.95	5.55	4.00	4.75	5.40
Chattanooga	4.21	4.41	4.41	4.11	4.11	5.91	4.16	4.06	4.66
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.25
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.09	4.34	4.34	3.99	3.99	5.59	4.09	4.84	5.49
Memphis	4.31	4.51	4.51	4.21	4.21	....	4.26	5.01	5.66
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.00	6.40	3.95	3.95	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	4.95	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.00	4.50	6.50	4.00	4.25	5.70	4.20	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	4.30	4.50	5.05	5.75
San Francisco	4.80	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.85

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.845c	4.65c	4.35c	7.97c	6.52c	6.27c	9.37c	8.97c	7.52c
New York	3.92	4.82	4.32	7.82	6.37	6.12	....	9.00	7.55
Philadelphia	3.88	4.53	4.25	....	....	....	....	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Buffalo	3.79	4.35	4.10	7.60	6.15	5.90	8.50	8.60	8.15
Pittsburgh	.	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.50	4.07	7.91	6.46	6.21	9.31	8.92	7.49
Chattanooga	....	4.86	....	....	....	....	....	....	....
Chicago	3.87	4.30	4.00	7.60	6.15	5.90	9.00	8.60	7.15
Minneapolis	....	4.77	4.25	7.95	6.50	8.97	9.57	9.17	7.72
Milwaukee	.	4.41	4.16	7.81	6.36	8.61	9.21	8.81	7.36
St. Louis	3.96	4.54	4.29	7.94	6.49	6.24	8.34	8.94	7.49
Memphis	. .	4.80	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Houston	....	....	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	...	8.00	8.00	8.65	....	....
Portland, Oreg.	.	5.85	5.85	9.00	8.00	7.85	8.70	...	.. .
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Jan. 20

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$30.00 6 0 0	$19.50	2 9 0
Basic bessemer	....	20.80	2 12 0
Hematite, Phos. .03-.05	36.25 7 5 0*	.....	.....
Billets	$39.38 7 17 6	$43.01	5 7 6
Wire rods, No. 5 gage	56.38 11 5 6	46.00	5 15 0
Standard rails	$50.63 10 2 6	$46.00	5 15 0
Merchant bars	2.62c 11 15 0	1.99c to 2.17c	5 10 0 to 6 0 0
Structural shapes	2.37c 10 12 6	1.91c to 1.94c	5 5 0 to 5 7 6
Plates, †¼ in. or 5 mm.	2.58c 11 11 3	2.35c to 2.59c	6 10 0 to 7 2 6
Sheets, black, 24 gage or 0.5 mm.	3.34c 15 0 0	2.63c to 3.18c	7 5 0 to 8 15 0°
Sheets, gal., 24 ga., corr.	3.96c 17 15 0	3.53c to 3.89c	9 15 0 to 10 15 0
Bands and strips	2.95c 13 5 0	2.09c to 2.17c	5 15 0 to 6 0 0
Plain wire, base	4.35c 19 10 0	2.27c to 2.42c	6 5 0 to 6 17 6
Galvanized wire, base	5.18c 23 5 0	2.90c to 3.18c	8 0 0 to 8 15 0
Wire nails, base	4.13c 18 10 0	2.71c to 2.90c	7 10 0 to 8 0 0
Tin plate, box 108 lbs.	$5.63 1 2 6	....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$27.25	5 9 0(a)	$18.50	554	$24.67	730	$25.38	63
Basic bess. pig iron	25.00	5 0 0(a)	.....	...	.....	..	28.00	(b)69.50
Furnace coke	9.38	1 17 6	6.31	189	7.27	215	7.66	19
Billets	39.38	7 17 6	28.06	840	32.45	960	38.88	96.50
Standard rails	2.26c	10 2 6	1.73c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.55c	11 9 0	1.62c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.46c	11 0 6	1.58c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.61c	11 14 3	2.03c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.51c	15 15 0§	2.35c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.13c	18 10 0	3.38c	2,250	4.50c	3,000	6.66c	370
Plain wire	4.35c	19 10 0	2.49c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.72c	12 4 0	1.82c	1,210	2.32c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. del. Middlesbrough. b hematite. °Close annealed.

**Gold pound sterling carries a premium of 64.4 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	10.00
Birmingham, No. 2.	9.00
Bos. dock No. 1 exp.	14.00-14.50
N. Eng. del. No. 1..	13.50
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	11.00-11.50
Chicago, No. 1	13.00-13.50
Cleveland, No. 1 ..	12.50-13.00
Cleveland, No. 2 ...	11.50-12.00
Detroit, No. 1	9.50-10.00
Eastern Pa., No. 1..	15.00
Eastern Pa., No. 2..	14.00
Federal, Ill.	11.50-12.00
Granite City, R. R..	12.75-13.25
Granite City, No. 2.	11.50-12.00
†Los Angeles, No. 1	9.00- 9.50
†Los Angeles, No. 2	7.50- 8.00
New York, No. 1....	†11.00
N. Y. dock No. 1 exp.	13.50
Pitts., No. 1 (R. R.)	15.50-16.00
Pitts., No. 1 (dlr.)..	14.00-14.50
Pittsburgh, No. 2...	12.00-12.50
St. Louis, R. R.....	12.75-13.25
St. Louis, No. 2....	11.50-12.00
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Toronto, dlrs. No. 1	10.00
Toronto, No. 2	9.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers....	11.00-11.50
Chicago, factory ..	11.50-12.00
Chicago, dealer	10.50-11.00
Cleveland	12.00-12.50
Detroit	10.25-10.75
E. Pa., new mat. ..	15.00
E. Pa., old mat.	10.50-11.00
Pittsburgh	14.00-14.50
St. Louis	8.50- 9.00
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	10.00-10.50
Cincinnati, del.	9.50-10.00
Cleveland	9.00- 9.50
Pittsburgh	13.00-13.50
St. Louis	6.75- 7.00
Toronto, dealers ...	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.00- 6.50
Detroit	7.00- 7.50
† Los Angeles	4.00
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.50-18.00
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Pitts, 3 ft. and less	18.25-18.75
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	13.00-13.50
Cleveland	16.50-17.00
Pittsburgh	15.75-16.25
St. Louis	13.50-14.00
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	12.00-12.50
Chicago, net	8.50- 9.00
Cincinnati, dealers..	5.50- 6.00
Detroit, net	8.50- 9.00
Eastern Pa.	13.00-13.50
New York, fdry. ...	†8.50- 9.00
St. Louis	9.00- 9.50
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	17.50-18.00
Chicago, coil	17.00-17.50
Chicago, leaf	15.50-16.00
Eastern Pa.	18.00-18.50
Pittsburgh	18.25-18.75
St. Louis	15.50-16.00

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	12.50-13.00

RAILROAD SPECIALTIES

Chicago	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	17.50-18.00
Cleveland, crops ...	19.50-20.50
Eastern Pa., crops..	19.00-19.50
Pittsburgh, crops...	18.25-19.25

FROGS, SWITCHES

Chicago	13.00-13.50
St. Louis, cut	13.50-14.00

SHOVELING STEEL

Federal, Ill.	11.00-11.50
Granite City, Ill. ..	11.00-11.50
Toronto, dealers....	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net..	10.00-10.50
Cincinnati, No. 2...	9.50-10.00
Eastern Pa., No. 1..	15.50-16.00
St. Louis, No. 1 ...	9.00- 9.50
St. Louis, No. 2....	13.00-13.50
Toronto, No. 1 dlr...	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	11.00-11.50
Chicago, No. 1	11.50-12.00
Cincin., No. 1, deal..	8.50- 9.00
Cincinnati, No. 2...	3.00- 3.50
Cleveland, No. 2 ..	8.50- 9.00
Detroit, No. 1, new.	9.50-10.00
Valleys, new, No. 1	12.50-13.00
Toronto, dealers....	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	7.00- 7.50
Chicago	6.50- 7.00
Cincinnati, dealers..	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
Eastern Pa.	8.50- 9.00
New York	†5.00- 5.50
Pittsburgh	8.00- 8.50
St. Louis	5.00- 5.50
Toronto, dealers....	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†2.50
Buffalo	7.00- 7.50
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
Eastern Pa.	8.00- 8.50
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers....	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem...	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	7.00- 7.50
Chicago	6.50- 7.00
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
E. Pa., chemical....	13.50-14.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers....	7.50

PIPE AND FLUES

Cincinnati, dealers..	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.50-10.00
Chicago, net	8.50- 9.00
Cincinnati	5.50- 6.00
Eastern Pa.	13.00-13.50
New York	†8.50- 9.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	11.00-11.50
Cleveland	11.00- 11.50
Detroit	9.00- 9.50
Pittsburgh	12.50-13.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

ARCH BARS, TRANSOMS

St. Louis	15.50-16.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.00-12.50
Chicago, elec. fur...	11.50-12.00
Eastern Pa.	14.00-14.50
St. Louis	9.50-10.00
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	17.00-17.50
Boston district	†14.00
Chicago, net	17.50-18.00
Eastern Pa.	21.50-22.00
St. Louis	18.50-19.00

SHAFTING

Boston district	†15.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron...	†10.00
Buffalo, steel	17.00-17.50
Chicago, iron	15.00-15.50
Chicago rolled steel	15.00-15.50
Cincinnati, iron	15.00-15.50
Eastern Pa., iron..	16.50-17.00
Eastern Pa., steel..	18.00-18.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel...	18.25-18.75
St. Louis, iron	14.00-14.50
St. Louis, steel	15.50-16.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2..	12.00
N. Eng. del. textile.	15.50-16.00
Buffalo, cupola ...	14.00-14.50
Buffalo, mach.	15.50-16.00
Chicago, agri. net..	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net.	12.50-13.00
Cincin., mach. cup...	10.50-11.00
Cleveland, mach....	17.00-17.50
Eastern Pa., cupola.	16.00-16.50
E. Pa., mixed yard..	14.00-14.50
Pittsburgh cupola..	16.00-16.50
San Francisco, del..	13.50-14.00
Seattle	8.00
St. Louis, No. 1 ...	12.00-12.50
St. L., No. 1, mach.	12.50-13.00
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break..	†9.25
N. Eng., del.	12.50-13.00
Buffalo, break	11.50-12.00
Cleveland, break....	14.50-15.50
Detroit, break.	10.00-10.50
Detroit, auto net...	12.50-13.00
Eastern Pa.	14.50
New York, break. ..	†10.50-11.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	16.00
Buffalo	14.00-14.50
Chicago, R. R.	14.50-15.00
Cincin., agri. del...	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R. ..	16.50-17.50
Pittsburgh, rail	13.75-14.25
St. Louis, R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	14.00-14.50

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	14.75-15.25

LOW PHOS. PUNCHINGS

Buffalo	17.00-17.50
Chicago	15.00-15.50
Eastern Pa.	19.00-20.00
Pittsburgh (heavy).	18.00-18.50
Pittsburgh (light)..	17.50-18.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	nominal
Swedish low phos...	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom..	12.00
Tungsten, sh. ton. unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f..	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% .. .. non.	45.00
So. African, 50-52% nom.	45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 72

Pittsburgh—Although no new developments have appeared in the sheet market, the constant flow of orders has been enough to hold the production rate fairly steady. The outlook for the coming week, however, is not so good and it may bring reductions. Mills are rolling at rates varying from 15 to 40 per cent, with the average at about 25 per cent or a trifle less.

Galvanized rate continues strong at 34 per cent, with no prospect of a drop yet in sight. Cold strip remains at the 22 per cent production figure established last week also, while hot strip production is up one point to the same figure, 22 per cent.

Small automotive production accounts for most of the sheets now being consumed, it is believed, with most jobbers sitting tight although stocks are low, some being practically nonexistent. No releases are forthcoming on booked orders in spite of this condition. Spot orders are still the main source of business, as jobbers are supplying many consumers who might order direct from mills if rolling schedules were not so irregular. Another factor slowing up buying is the fact many sheet users have finished products on hand above normal condition and their steel stocks are not being depleted as rapidly as might be otherwise.

Cleveland — Specifications continue to show the moderate improvement noted since the first of the month, as the stocks of a number of consumers, who have not been in the market for the last 60 to 90 days, reached rock bottom. Buying by auto manufacturers has shown signs of revival with Buick entering the market on a small scale recently and releases are expected from Ford and General Motors soon. A variation in the mill selling methods on sheets has recently been instituted with the announcement that if the average weight on an item in sheets exceeds the estimated weight the buyer can charge back the difference. Prices are firm.

Chicago — Aided by a small gain in automotive demand, sheet business the past week showed a slight increase. Orders from miscellaneous consumers have been better but total demand is insufficient to be reflected markedly in mill operations. Farm equipment manufacturers have curtailed schedules in some instances and shipments of some tonnages have been suspended. Sheet producers lack backlogs and early deliveries are available on all grades.

Boston — The mild improvement in sheet demand is barely maintained. Due mostly to some fill-in buying by jobbers, better specifications from industrial and miscellaneous sources hardly balance a slight recession in releases by the former. Requirements of refrigerator builders are slightly heavier, but small tank, heating and stamping shop needs are small. Consumer stocks are considerably lower in most instances, but buying is confined to current consumption, which in most manufacturing industries is light and spotty.

New York—Continued small improvement in sheets, tempered by uncertainty with respect to prices, is attributed largely to better specifications from jobbers and manufacturers of refrigerators. Open weather until recently had resulted in a fairly good movement from warehouse, with stocks now having to be replaced, and in the case of refrigerator manufacturers, they are stepping up production in anticipation of the spring buying season.

On a recent opening of 488 tons of No. 24 gage hot-rolled pickled annealed sheets, with steam blue finish, for automobile license tags for the New York state division of standards and purchases, Albany, all bids, except one, worked back to 4.04c, delivered, Auburn, N. Y., for maximum quantities. The one exception was that of a producer, who quoted on a description other than specified. Should the award be made, deliveries must be completed by March 31. This is in addition to a similar tonnage placed last month with Egleston Bros. & Co., Long Island City, N. Y.

Sheet Metal Mfg. Co., Youngstown, O., was low on most items involved in navy schedule No. 2458, comprising 1570 tons of black and galvanized sheets for various yards, according to information here.

Philadelphia — Quotations are being firmly maintained on prime sheets but consumers report rejects are offered at more attractive levels. Some acceleration in miscellaneous demand is noted but larger consumers remain generally out of the market. The leading auto bodymaker is operating at 20 per cent of capacity, while a second is working two shifts compared with three before the turn of the year. Some bright spots appear, however. A large air conditioning equipment manufacturer is going ahead on a complete line of self-contained models completely enclosed with sheet steel hoods.

Cincinnati — Sheet demand is up about 25 per cent from the post-holiday levels, representing broad buying in which there is some tonnage from automobile manufacturers. Weather favorable to outdoor projects has brought early interest in galvanized. Some purchases indicate a break in the barrier formed by fourth quarter inventories, against new business. The trend in specifications for stoves and electric refrigerators is toward the seasonal upturn.

St. Louis — Demand for sheets continues slowly upward, improvement being due to a larger number of orders for relatively small tonnages for prompt delivery. With the mills able to make deliveries as needed and prospects of price advance remote, consumers have no incentive for buying into the future. Jobber demand has shown symptoms of betterment, and this outlet is expected to broaden with progress of the season. Specifications on enameling stock by stove makers have picked up moderately, and implement makers continue to account for liberal tonnages. Outlook for tank plate requirements by the oil industry is promising. Prices are firm.

Birmingham, Ala. — Due to increased bookings of roofing, sheets have shown improvement recently, particularly since Jan. 1. Production of sheets is practically at capacity.

Strip

Strip Prices, Page 73

Cleveland—Manufacturers of electrical equipment and other household utilities are said to be entering the market for actual needs after being absent in some instances for 60 to 90 days. This would indicate that inventories have reached the point where additions have become necessary. Releases from local stamping concerns has shown a moderate increase as prospects of improved demand from auto builders materialized. Prices are unchanged.

Chicago — While occasional gains appear in steel strip demand, the improvement has been insufficient to indicate the start of a definite upward trend. Orders are small and dictated entirely by actual needs since customers are not disposed to add to inventories. Automotive purchases, while slightly heavier, still are light.

Boston — In spots there has been a slight gain in narrow cold-rolled strip buying for immediate delivery, but the increase to date has been disappointing. Rerolling operations are unchanged, a few producers being on three days a week schedules, one turn. On the whole production

is not above 30 per cent of capacity. There is no advance buying. In a few instances mills have orders for six weeks delivery, but this applies to special stock with most incoming tonnage for prompt shipment. Prices are firm with no consumer pressure for concessions.

New York — Cold strip buying is confined to fill-in needs with consumers placing hand-to-mouth requirements for prompt shipment. Finishing mill operations are barely held at 30 per cent as the uneven flow of small orders complicates rolling schedules. There is no advance buying and hot strip volume is also in small lots of a miscellaneous character. Prices are steady and unchanged.

Philadelphia — Narrow strip specifications in both hot and cold-rolled grades show only mild improvement. One or two job stampers are slightly more active but little upturn is noted among other consumers. Prices remain steady.

Plates

Plate Prices, Page 72

Pittsburgh — Plate producers report little change in tonnage volume. Demand continues slow from railroads and structural fabricators. Some slight activity has been recorded among marine fabricators, the Campbell Transportation Co., Pittsburgh, awarding a contract for 10 cargo barges requiring 2350 tons of plates and shapes to American Bridge Co., and an additional contract for three fuel flats calling for 375 tons of plates and shapes to Bethlehem Steel Co. The new state psychiatric hospital to be erected in Pittsburgh will require 2600 tons of plates and shapes, to be fabricated by Fort Pitt Bridge Co.

Cleveland — Plate sellers note little improvement in general run of miscellaneous orders. Demand for floor plates and other standard grades continues at low levels. However, approximately 650 tons, 9000 feet, of 36-inch steel pipe for a water main for the city of Cleveland is expected to be placed soon. The Chesapeake & Ohio railroad has recently awarded a contract to the American Car & Foundry Co., Berwick, Pa., for construction of 25 covered hopper cars of 70-ton capacity. Prices are firm.

Chicago — Various types of structural work account for the largest tonnages of plates among awards and inquiries. Railroad demand is negligible and is expected to continue slow, in view of the lack of inquiries for new equipment. Outstanding plate business pending includes 8000 tons for Grand Coulee dam penstocks and approximately 2000 tons for the Clarksville, Mo., dam. Plate shipments range up to 10 days.

Boston — Most plate buying is in small miscellaneous lots with few full car orders. Lacking tank inquiry and requirements for specified projects, demand is mostly for fill-in industrial needs, with railroads taking little tonnage. Prompt delivery is asked on practically all business. While the potential requirements for larger shipyards are large, there is less pressure for plates as much of the work covers months in the future.

New York—Further ship work is active here, with the Socony-Vacuum Oil Co. opening bids Jan. 31, on two tankers, estimated to require a total of 10,000 tons of hull steel. This comes one day before the opening by the United States Maritime commission on the 12 cargo ships noted in a previous issue. Incidentally, bids on the Socony-Vacuum boats are being handled direct rather than through the Maritime commission as was the case with the 12 tankers recently placed for the Standard Oil Co. of New Jersey. Inquiries for steel for the latter tankers are not expected to be formally issued for at least another two or three weeks.

Meanwhile, plate specifications show little improvement, with the absence of railroad tonnage seriously felt by producers. At least three oil refinery projects, one abroad, are under contemplation, but they have not as yet reached an active stage.

Philadelphia—Miscellaneous plate business is a shade better, according to leading producers but demand from major consuming sources fails to show much improvement. Pusey & Jones, it is reported, will place steel shortly required for a government dredge awarded recently. While a large amount of additional ship work is ahead, the plates will not be required for some time. Reading railroad shops are closed, with a program involving several hundred cars started last year about half completed. Pennsylvania railroad is still working on its 1937 program, which will be completed about March 1, it is understood. This road is expected to launch an extensive car repair program as soon as a favorable decision is reached on the freight rate increase. The large locomotive works here has booked the steel required for locomotives placed last year and has taken orders for only one or two more this year.

Seattle—Interest centers in pending award for approximately 12,000 tons involved in penstocks and inlet pipes for Coulee dam, bids under consideration. Babcock & Wilcox Co., New York, is low at $1,903,716 delivery job and Western Pipe & Steel Co., San Francisco, low at $1,456,624 f.o.b. Reclamation bureau is checking freight costs.

Plate Contracts Placed

2350 tons, plates and shapes, ten cargo barges, for Campbell Transportation Co., to American Bridge Co., Pittsburgh.

515 tons, 40,000 and 80,000-gallon tanks, Home Fuel Oil Co., Port Newark, N. J., to Chicago Bridge & Iron Co., Chicago.

375 tons, plates and shapes, three fuel flats, each 125 x 26 x 9 feet, of 400-ton capacity, for Campbell Transportation Co., to Bethlehem Steel Corp., Bethlehem, Pa.

240 tons, penstocks, Appalachian Electric Power Co., Radford, Va., to Tippet & Wood, Phillipsburg, N. J.

235 tons, tank barge, Ashland Oil & Refining Co., Ashland, Ky., to Nashville Bridge Co., Nashville, Tenn.

200 tons, standpipe, Scituate, Mass., to Chicago Bridge & Iron Co., Chicago.

165 tons, oil tanks, Ashland Oil & Refining Co., Covington, Ky., to Chicago Bridge & Iron Co., Chicago.

Plate Contracts Pending

210 tons, elevated tank and tower, Goldsboro, N. C.; bids Jan. 26.

Unstated tonnage, 22 open hopper barges without covers, bids Feb. 21 to Inland Waterways Corp. New Orleans.

Unstated tonnage, one wrought iron hull for 15-ton derrick boat, bids Feb. 1 to U. S. engineer, Mobile, Ala.

Bars

Bar Prices, Page 72

Cleveland — Bar producers report a moderate improvement in general market conditions, with specifications showing a slight upward trend and increasing confidence becoming more apparent. Additional business continues to appear from customers who have not been in the market for two or three months. Requirements for alloy steel bars from auto partsmakers, while showing some improvement are still below former estimates. Inventories of most consumers are considerably below that of 30 days ago and will soon reach the point where stock buying is necessary.

Chicago—Steel bar sales show no improvement and shipments have gained little. Farm equipment manufacturers have suspended delivery on some tonnage contracted for a short time ago and operations of this group have receded, though better schedules are in prospect later this quarter. Occasional gains are shown in automotive demand. Warehouse buying is light but slightly heavier than a month ago.

Boston — Commercial steel and

alloy bar buying is in small lots with a slight, but spotty improvement in aggregate demand which is somewhat broader. Forging bar specifications have also increased, due largely to buying by one consumer. Much of the alloy business is being done through jobbers and dealers in special steels, this being notably true of machine builders' requirements.

New York—Bar consumers are moving cautiously pending clarification of the price situation. The market has held firmly and some trade leaders believe that it will continue to do so, nevertheless, there is hesitancy in a number of quarters. Meanwhile, stock replacements are not urgent with a number of buyers, who, as a result, can afford to mark time for the present. Lack of demand from railroads and bolt and nut manufacturers is leaving a considerable gap in specifications. Such improvement in buying as has been noted so far this year is coming principally from jobbers. The largest consumers of bars are still the machinery manufacturers, who are active mostly in cleaning up back orders. Their particular interest lies in cold-finished bars.

Philadelphia—Merchant bar sellers are encountering a slight lift in miscellaneous business but no general expansion is noted. Some machinery builders still are fairly busy on unfilled orders. This is tending to relieve some slackness in order directions. Fill-in business continues to come in from warehouses, but in small lots. No deviation is noted in prices.

Birmingham, Ala. — Some pick-up in demand from manufacturers of agricultural implements has been reflected with the result bars are moving at a better rate. Orders are in better proportion to shipments.

Pipe

Pipe Prices, Page 73

Pittsburgh — Most active market is the tubular goods division. Tube-makers here indicate production rates are holding between 35 and 40 per cent, with a constant volume of new orders. No large orders have been placed recently, activity being largely confined to diversified small tonnages. Oil well casing is active with some pipeline business. No action has as yet been reported on pipeline inquiries recently opened for bids.

Cleveland — Bids went in last week on 620 tons of 36-inch steel pipe for the city of Cleveland for the first section of a water main from Parma reservoir to Rocky River, O. Miscellaneous requirements remain unchanged with domestic and industrial demand at low levels. Some municipal projects are expected soon if anticipated aid from PWA materializes. Prices continue firm.

Chicago — Prospective business in cast iron pipe is moderately heavier and while no marked pickup in demand is in early prospect, occasional gains in business are looked for. Chicago is expected to place 1918 tons of 8 and 12-inch pipe to the two interests which were low bidders on a recent letting.

New York — Cast pipe buying continues in small miscellaneous lots with some decline in such purchasing due partly to adverse weather conditions for laying. New York city is expected to ask bids shortly on 1500 tons for yard stocks while a steel pipe project, Avenue P, Brooklyn, aggregating close to $500,000 in the general contract will take the heaviest steel pipe tonnage, large diameters, in several months.

Birmingham, Ala — Pipe plants are operating on three and four-day schedules for approximately 40 per cent. Inquiries are small and scattered, mostly from PWA sources

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with most utility buyers reported out of the market.

San Francisco — Awards of cast iron pipe were limited to lots of less than 100 tons and awards so far this year total 362 tons, compared with 1622 tons for the same period a year ago. Bids have just been taken on 918 tons of 4 to 12-inch pipe for the La Mesa, Lemon Grove & Spring Valley Irrigation district, La Mesa, Calif.

Seattle—Active inquiry has not developed but improvement is indicated next month. Crane Co., Seattle, has been awarded 150 tons of 2 to 8-inch steel pipe for the Silver Lake, Wash., district. Spokane has called bids Jan. 27 for furnishing 250 tons of 6, 8 and 12-inch cast iron pipe. Pasco, Wash., will call bids about Feb. 3 for a $33,000 improvement, including a 400,000-gallon steel tank and on Jan. 20 for unstated tonnage of cast iron and accessories. H. L. Gilbert, Portland, Oreg., engineer, will receive bids Feb. 8 for furnishing the Oak Lodge water district a tonnage of 2 to 6-inch steel pipe. Contract for a $19,000 improvement at Elgin, Oreg., has been approved by regional PWA director.

Steel Pipe Placed

150 tons, 2 to 8-inch, Silver Lake, Wash., to Crane Co., Seattle.

Unstated tonnage, 50 lengths, 18-inch shore pipe, United States engineer, Washington, to Lancaster Iron Works, Lancaster, Pa.; bids Jan. 13, cir. 61.

Cast Pipe Pending

1918 tons, 8 and 12-inch pipe; United States Pipe & Foundry Co., Burlington, N. J., and Lynchburg Foundry Co., Lynchburg, Va., low.

918 tons, 4 to 12-inch La Mesa, Lemon Grove & Spring Valley irrigation district, La Mesa, Calif.; bids opened.

250 tons, 6 to 12-inch, for Spokane, Wash.; bids Jan. 27.

236 tons, 2 to 6-inch, cast iron or steel, Oak Gove, Oreg., bids Feb. 8.

197 tons, 6 to 12-inch, Spokane, Wash.; bids Jan. 27.

181 tons, 2 to 8-inch, cast iron or steel, Junction City, Oreg.; bids Jan. 24

159 tons, 6-inch, Class 150, treasury department, San Francisco, Invitation 4938; bids opened.

125 tons, Panama, schedule 3325· bids Feb. 2.

115 tons, 16-inch and under, Goldsboro, N. C., bids Jan. 26.

Steel Pipe Pending

Unstated tonnage, 3000 feet of 20-inch electrically welded discharge pipe; bids Jan. 31, United States Engineer, Louisville, Ky.

Semifinished

Semifinished Prices, Page 73

New York—An inquiry for approximately 2000 tons of 2 x 2-inch billets for Continental Europe is being figured by several eastern producers with exporters pressing for concessions under the listed domestic price.

Wire

Wire Prices, Page 73

Cleveland — Specifications for manufacturing wire and miscellaneous wire products have increased moderately since the first of the month and a still further improvement is expected over the next few weeks. Auto partsmakers are expected to issue releases soon as the demand from auto builders improves. Mill operations in most departments are said to average less than 30 per cent of capacity. Prices are firm.

Chicago — Steel wire demand is holding its own, with occasional small gains in orders for manufacturers' wire. Shipments to automotive interests are fairly steady, with some change for the better. Activity in merchant wire products at various plants in this district is slow to increase.

Boston — While a few wire producers note slightly better demand, the improvement is not general and finishing operations are unchanged at 25 to 30 per cent. The meager demand is well diversified. Improvement is mostly from jobbers of merchant products. Manufacturers' wire continues to drag, although consumer stocks are low as a rule Fabricators of consumer goods, however, lack orders and are not expected to place much business with mills until their own volume is heavier. Wire rod buying continues light.

John A. Roebling's Sons Co., Trenton, N. J., will supply wire for the main cable strands, suspender ropes, A.W.G. cable for the Deer Isle, Me., suspension bridge, about 275 tons, taking the sub-contract through Phoenix Bridge Co., Phoenixville, Pa., the latter to fabricate and erect the superstructure.

New York — What slight gain registered in wire buying has been centered in merchant products, jobbers in some instances placing fill-in orders for prompt delivery. Demand for most wire goods, however, is slack with practically no improvement in manufacturers' wire or material entering into fabricated consumer goods. Rope is slightly more active than common wire, although the volume continues small. Prices are steady.

Birmingham, Ala. — Improvement is evident in demand for wire products, Southern mills report. Buying is not large individually but satisfactory in the aggregate.

Rails, Cars

Track Material Prices, Page 73

Inquiry and buying by railroads continue to come out, for small lots only, general programs being held back until the rate outcome is known. Chesapeake & Ohio has placed 25 hoppers and Argentine railways ask bids on 250 to 500 box cars. Chicago & North Western is asking bids on three streamlined locomotives, asking tenders on various kinds of power.

About 9000 tons of fastenings will be required for the recent Chesapeake & Ohio rail order.

Rail Orders Pending

New York Chicago & St. Louis railroad, 8600 tons of 112 pound rails, divided as follows: Carnegie-Illinois Steel Corp., 5600 tons, Inland Steel Co., 1700 tons, Bethlehem Steel Corp., 1300 tons.

Car Orders Placed

Chesapeake & Ohio, 25 seventy-ton covered hoppers to American Car & Foundry Co., New York, for Berwick, Pa., shops.

Car Orders Pending

Argentine State Railways, 250 to 500 thirty-three-ton box cars; bids asked.

Lehigh & New England, 50 to 75 seventy-ton covered cement hoppers; bids asked.

Locomotives Pending

Chicago & North Western, three streamlined passenger locomotives; bids asked on steam, diesel-electric and steam turbine-electric types.

Navy, two 12-ton gasoline locomotives for Philadelphia navy yard; bids Feb. 1.

Buses Booked

Twin Coach Co. Kent, O.: Ten 40-passenger for Los Angeles Railway Corp., Los Angeles; ten 35-passenger for Akron Transportation Co., Akron, O.; nine 27-passenger for Georgia Power Co., Atlanta, Ga.; five 23-passenger for Winnipeg Electric Co., Winnipeg, Man.; five 41-passenger for Baltimore Transit Co., Baltimore; five 31-passenger for Youngstown Municipal Railway Co., Youngstown, O.; five 23-passenger for Arkansas Power & Light Co., Little Rock, Ark.; three 25-passenger for Erie Coach Co., Erie, Pa.; three 23-passenger for Kansas City Public Service Co., Kansas City, Mo.; two 35-passenger for Texas Motorcoaches Inc., Fort Worth, Tex.; two 31-passenger for El Paso Electric Co., El Paso, Tex.

A. C. F. Motors Co., New York: Eighteen 25-passenger for Harrisburg Railways Co., Harrisburg, Pa.; ten 30-passenger for Staten Island Coach Co., Staten Island, N. Y.; five 35-passenger for Memphis Street Railway Co., Memphis, Tenn.; three 35-passenger for San Diego Electric Railway Co., San Diego, Calif.; two 28-passenger for Union Bus Co., Jacksonville, Fla.; two 30-passenger for Gary Railways Co., Gary, Ind.

Shapes

Structural Shape Prices, Page 72

Philadelphia—Contracts for about a third of the $65,000,000 Pennsylvania state program has been reported placed, with about 35 per cent of the general contracts going to McCloskey & Co., Philadelphia. This program will run over several months. Considerable competition for the steel requirements is noted. Fabricators report steel for a 2200-ton Harrisburg job went at $66 a ton, delivered. Several jobs not included in the state program are up for bids over the next few weeks.

Boston — Structural contracts have slumped. Inquiries are also small with 325 tons for a Manchester, N. H., armory included. A considerable number of small projects are being estimated. Contractors are slow to close on much of the steel already estimated. Bridge requirements are the smallest in months.

New York — Following a slight flurry in structural contracts, awards are again down with new inquiry under expectations. Bids close this week for a North Beach, N. Y., airport, 1400 tons. Pending requirements, estimated at close to 18,000 tons, are mostly public work.

Pittsburgh — Activity has held at about the same level, with some small inquiries entering the market and a few contracts being placed. Postponement of action on many contracts has occurred, delays being most noticeable among municipal and county projects. Contracts totaling 1000 tons have been placed for the Kanawha boulevard bridge over Elk river, Charleston, W. Va.

Cleveland — Private work for industrial expansion is slow to appear and limited to only small tonnages. Sandusky, O., is said to be planning a power plant involving approximately 800 tons. Inquiries on this project are expected within 30 days. The two state bridges at Toledo, O., involving 400 tons are still pending, other pending state work totals approximately 1000 to 1500 tons for miscellaneous grade crossings.

Shape Awards Compared

	Tons
Week ended Jan. 22	**23,094**
Week ended Jan. 15	**15,625**
Week ended Jan. 8	**16,687**
This week, 1937	**13,715**
Weekly average, 1937	**16,060**
Weekly average, 1938	**13,093**
Weekly average, December	**13,591**
Total to date, 1937	**93,341**
Total to date, 1938	**64,241**

Includes awards of 100 tons or more.

Chicago — Bridge inquiries for Illinois, Indiana and Wisconsin total about 1200 tons but most new projects are small. About 6000 tons is involved in small miscellaneous inquiries. Several large lots now pending are expected to boost awards shortly. Lock improvements here are under consideration by the Chicago sanitary district requiring about 2000 tons of piling.

Seattle — Largest subcontract immediately pending involves 600 tons for the Seattle armory, general contract to A. D. Belanger, Seattle. Low bidder for an Idaho state 343-foot steel and concrete span over the Clearwater river is Colonial Construction Co., Spokane, at $107,927, tonnages unstated.

Shape Contracts Placed

2600 tons, phychiatric hospital, Pittsburgh, to Fort Pitt Bridge & Iron Works, Pittsburgh.

1750 tons, sludge, filter and incinerator building, Detroit, to Fort Pitt Bridge Works, Pittsburgh.

1500 tons, eighteen story apartment, Fifty-seventh street and Sutton place, New York, to Harris Structural Steel Co., New York.

1000 tons, Kanawha boulevard bridge over Elk river, Charleston, W. Va., to

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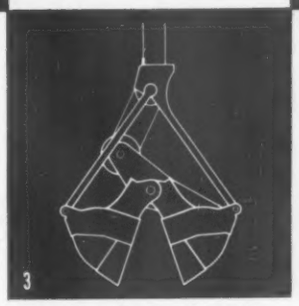

3 Blaw-Knox Two Line Buckets for hard digging; built at weights suitable for handling O. H. slag, limestone, Spiegel, Ferro Mang., pig iron. Adaptable to overhead cranes and locomotive cranes.

4 When "hook-on" operation is necessary, much is gained by using Blaw-Knox 2 line type hook-on buckets. Especially suited to O. H. cinder yard service where 2 hooks are usually available.

6 Blaw-Knox Two Line Buckets for locomotive cranes built at various weights to suit operating requirements including medium weight types adaptable to broad range of service.

5 Blaw-Knox Single Line "Hook-On" Buckets. Heavily built for O. H. service and medium weight types for handling roll scale, also for handling clay and other materials in O. H. Ladle House.

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Mt. Vernon Bridge Co., Mt. Vernon, O.
600 tons, building, Procter & Gamble Co., Ivorydale, O., to R. C. Mahon Co., Detroit.
470 tons, buildings, Bloomsburg Teachers college, Pennsylvania, to Bethlehem Fabricators Inc., Bethlehem, Pa.
340 tons, bridge, avenue Z, Brooklyn, N. Y. for Brooklyn Manhattan Transit railroad, to Bethlehem Steel Co., Bethlehem, Pa.; through Wilson & English Construction Co., New York.
340 tons, bridge, Port Jefferson-Riverhead section, Suffolk county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through E. L. North, Islip N. Y., general contractor.
325 tons, school, Glen Cove, Long Island, N. Y., to Drier Iron Works, New York.; through Andrew Weston Co., Woodmere, N. Y.
300 tons, store building, S S. Kresge Co., Baltimore, to Dietrich Bros, Inc., Baltimore.
295 tons, bridge, Randolph county, Missouri, to Bethlehem Steel Co., Bethlehem, Pa.
280 tons, store building, S. S. Kresge Co., Springfield, Mass., to Haarman Steel Co., Holyoke, Mass.
278 tons, gantry cranes, Chickamauga dam, Chattanooga, Tenn., to Lakeside Bridge & Steel Co., Milwaukee.
275 tons, high and elementary school, Springfield, Tenn., to Bedford Foundry & Machine Co., Bedford, Ind.
270 tons, school, Huntington, Long Island, N. Y., to Weatherly Steel Co., New York; through John H. Eisele Co., New York.
250 tons, highway bridge over Paint creek, Bainbridge, O., for Ross county commissioners, to Champion Bridge Co., Wilmington, O.
230 tons, Lancaster avenue bridge, Reading Co., Reading, Pa., to Phoenix Bridge Co., Philadelphia.
220 tons, buildings, state hospital, Hazelton, Pa., to Pine Iron Works Co., Pine Forge, Pa.
200 tons, central school, Caledonia, N. Y., to Hughes Iron Works, Rochester, N. Y.
185 tons, power station, Lawrence, Kans., to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.
158 tons, Duquesne avenue bridge, United States Engineer office, Los Angeles, to Wisconsin Bridge & Iron Co., Milwaukee.
150 tons, state highway bridge, route 25, section 29, Kearny, N. J., to Bethlehem Steel Co., Bethlehem, Pa.
145 tons, gates, Seminoe-Wyoming project, Spec. 990-D, bureau of reclamation, to Phillips & Davies Inc., Kenton, O.
140 tons, building, National Institute of Health, Bethesda, Md., to Bethlehem Fabricators Inc., Bethlehem, Pa.; George A. Fuller Co., New York, general contractor.
125 tons, bridge, project 437A, Beaufort county, South Carolina, to Vincennes Steel Corp., Vincennes, Ind.
120 tons, Stickney avenue bridge, Toledo, O., to Fort Pitt Bridge Works, Pittsburgh.
120 tons, Tornillo-Guadalupe bridge, Fabens, Tex., to Joseph T. Ryerson & Son Inc., Chicago.
110 tons, bridge, route 24-011, Elk county, Pennsylvania, to Lackawanna Steel Construction Co., Buffalo.
108 tons, bridge near Sange, Fresno county, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.
100 tons, shapes and bars, building addition, Travellers Insurance Co., Hartford, Conn., shapes to Standard Structural Steel Co., Hartford; reinforcing to Scherer Steel Co., Hartford; Allyn Wadhams Co., Hartford, general contractor.
100 tons, University of Washington swimming pool, to Pacific Car & Foundry Co., Seattle.

Shape Contracts Pending

2600 tons, sheet piling, improvement Alameda, Calif., waterfront for navy department; bids Jan. 26.
1812 tons, sheet piling, United States Engineer office, Los Angeles; Inland Steel Co., Chicago, low.
1400 tons, structural material for hangar, North Beach airport, New York, bids to state procurement officer, treasury department, New York.
1200 tons, coal bridge, Ford Motor Co., Detroit.
1135 tons, shapes and plates, Possum Kindom dam, on Brazos river near Mineral Springs, Tex.; bids direct Feb. 24, Ambursen Engineering Corp., New York, consulting engineer; also includes substantial quantities gates, hoists, power house crane, pumps, buterfly valves and trash racks.
640 tons, four state bridges, Illinois; bids Jan. 25.
600 tons, Seattle armory building; A. D. Belanger, Seattle, general contractor at $694,778.
600 tons, field artillery building, Seattle.
550 tons, state cancer hospital, Buffalo; bids rejected due to revision in construction plans.
500 tons, state armory building, Manchester, N. H.
500 tons, oil derricks, Kilgore, Tex.
425 tons, bridge, Bernalillo, N. Mex.
380 tons, bridge on Yerba Buena Island, San Francisco; bids opened.
365 tons, four state bridges, Indiana; bids Feb. 1.
350 tons, power plant, general state authority, California, Pa.
300 tons, three state bridges, Chippewa and Clark counties, Wisconsin; bids Jan. 28.
150 tons, boiler casings, Ohio Power Co., Power, W. Va.
150 tons, warehouse building, Rocco Van & Storage Co., Queens, New York.
120 tons, warehouse building, Procter & Gamble Co., Baltimore.
120 tons, administration building, S. Davis Wilson airport, Philadelphia.
100 tons, shapes and bars, highway project Townshend-Jamaica, Vt.; E. L. Somers Inc., Barre Vt., low, $65,594.12, bids Jan. 14
Unstated, 433-foot state bridge, Clearwater river, Ida.; Colonial Construction Co., Spokane, low.
Unstated, overcrossing at Hood River, Oreg.; Frank Watt Construction Co., Portland, low.

Cold Finished

Cold Finished Prices, Page 73

Pittsburgh—Sellers of cold-finished steel have noted a general increase in tendency among buyers to be exceedingly cautious and avoid accumulating stocks. Orders are small and appear on a hand-to-mouth basis, to fill only immediate needs. Occasional large orders are placed to cover needs for first quarter. It is also said of many of these orders that they contain clauses making the unused balance at the end of the quarter subject to cancellation by the buyer.

Most producers fail to see any change in this situation on the business horizon much before the first of May. While stocks generally are low, purchasers are not inclined to buy beyond orders now on books or pending.

Reinforcing

Reinforcing Bar Prices, Page 73

New York — Although slightly firmer, open bids on 350 tons of new billet steel reinforcing bars for New York city relief work, were still close to $5 a ton under the published market. While awards through general contractors are slightly heavier, new inquiry has slumped. Considerable tonnage is held up by the fact contractors are not in immediate need of material, although pressure for concessions continues.

Pittsburgh — Although several small contracts have been awarded action has not yet been forthcoming on several larger projects for which bids have been opened. Most producers are operating on restricted schedules, pending definite action on larger tonnages soon to be announced. Largest award recently was for 420 tons extension to prison at Eddyville, Ky.

Cleveland — Miscellaneous awards up to 25 tons continue to appear, but no improvement in inquiries is noted. The only large project pending involves 300 tons for the city of Cleveland for a sewage development on which action is expected soon. Fabricators are still on reduced schedules with no immediate improvement in sight. While no real test has been offered recently, prices are somewhat steadier.

Chicago — Inquiries for small lots are slightly more numerous and there has been a slight gain in awards of such tonnages. However, total business shows little change and is generally quiet. Work on which bids are expected to be taken soon include 1000 tons for an apartment building here and a similar tonnage for improvements to Soldier Field stadium, Chicago.

Philadelphia — Backlogs of district fabricators are none too heavy. Some Pennsylvania state work has materialized and a fair tonnage remains to be placed by fabricators for jobs which will be started early next spring. Private work continues disappointing. Fabricators

Concrete Bars Compared

	Tons
Week ended Jan. 22	**1,798**
Week ended Jan. 15	**8,717**
Week ended Jan. 8	**10,059**
This week, 1937	**1,424**
Weekly average, 1937	**6,266**
Weekly average, 1938	**5,998**
Weekly average, December	**4,111**
Total to date, 1937	**12,420**
Total to date, 1938	**23,993**

Includes awards of 100 tons or more.

maintain prices on formed bars are firmer. This is particularly true of material going into smaller jobs.

Boston — Except for 150 tons, required by the Massachusetts state procurement officer for WPA work, reinforcing steel buying and inquiry is for small lots. Bulk of pending work is less than 50 tons per job. Highway and bridge needs are notably small. Unit bids quoted by contractors on the limited volume of public work do not reflect higher reinforcing bar prices. Despite the lack of tonnage, 2.95c, delivered building site, Boston, is reported shaded.

San Francisco — Few awards or inquiries for reinforcing steel are noted and awards did not exceed 650 tons. So far this year 8468 tons have been placed as compared with only 2297 tons for the corresponding period in 1937. The largest award went to Kyle & Co., and involved 228 tons for a high school at Dinuba, Calif.

Seattle — Prospects are improving but rolling mills have only small orders in hand. Operations are intermittent as business appears. Awards include 300 tons to Bethlehem Steel Co., Seattle, for Washington state custodial school buildings at Buckley. Largest project pending is 800 tons for the Seattle armory, general contract to A. D. Belanger, Seattle.

Reinforcing Steel Awards

420 tons, prison, Eddyville, Ky., to West Virginia Rail Co., Huntington, W. Va.

350 tons, WPA needs, procurement division, treasury department, New York, to W. Ames & Co., Jersey City, N. J.; bids Jan. 14 and 18; requirements are in addition to 1455 tons bid Jan. 10, most being for delivery at Staten Island, Borough of Richmond, N. Y.

300 tons, Washington state custodial schools, Buckley, to Bethlehem Steel Co., Seattle.

228 tons, high school, Dinuba, Calif., to Kyle & Co., Fresno, Calif.

175 tons, addition to Santa Fe hospital, Los Angeles, to unnamed interest.

125 tons, Federal Aid project 48 and 49, route 2, Milford and Greenbush, Me., to Bancroft & Martin, Portland, Me.

100 tons, bridge, Rock Creek, near Shoreham hotel, Washington, national capitol parks projects 3B4, to Bethlehem Steel Co., Bethlehem, Pa.; Baben & Wright, Inc., Washington, general contractor.

100 tons, University of Washington swimming pool, Seattle, and miscellaneous, to Northwest Steel Rolling Mills, Seattle.

Reinforcing Steel Pending

4500 tons, Possum Kingdom dam, on Brazos river near Mineral Springs, Tex.; bids direct on steel Feb. 24.

1200 tons, sludge incinerator building, Detroit.

1000 tons, apartment building, Sheridan road and Oakdale avenue, Chicago; K. M. Vitzthum & Co. Inc., Chicago, architect.

1000 tons, improvements to Soldier Field stadium, Chicago.

800 tons, Seattle armory; A. D. Belanger, Seattle, general contractor.

750 tons, Wayne county road commission, Detroit; bids in.

470 tons, Kapalama drainage district, Honolulu, T. H.; general contract to Hawaiian Constructing Co.

250 tons, Panama schedule 3325; bids Feb. 2.

225 tons, junior live stock building, Springfield, Ill.

205 tons, municipal garage, Bronx, N. Y.; Weiss & Wiensier Co., Brooklyn, general contractor.

200 tons, junior high school, Mt. Lebanon, Pa.

181 tons, administration building and an addition to grand stand, State fair grounds, Sacramento, Calif.; bids opened.

160 tons, tax building Honolulu, T. H.; W. S. Ching low on general contract.

150 tons, bids to constructing quartermaster Army, San Antonio, Tex.; bids in.

150 tons, subway, Huntington avenue, Boston, invitation No. C4-N1-469, U. S. treasury procurement department; bids Jan. 24.

120 tons, ramps, 133-136th streets, West side elevated highway, New York; bids in.

117 tons, parking lot, 125 West Monroe street, Chicago.

110 tons, school, Bristol, R. I.

110 tons, state training school, Morganza, Pa.

105 tons, armory, Manchester, N. H., taking bids

100 tons, Idaho state bridge Snake river;

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Behind the Scenes with STEEL

Freedom of the Press

■ Every once in a while the press room phones to inform us that there are typographical errors in our column, mistakes in grammar (as though they could tell), and other inconsistencies. As a matter of fact, we had always considered our Behind The Steins nook one in which we could let our editorial hair down without danger of someone's wanting to split it. The Raised Eyebrow department has granted us poetic licentiousness to use mixed metaphors, Winchellistic spelling, and other editorial horrors ordinarily outlawed for use by STEEL's editors. We can even say "proven" instead of "proved," use atrocities like "inasmuch as," or begin a head with a per cent sign.

Shrdlu vs. RSD, Round 10

■ Readers Service Dept. this week reports the only news concerns a subscriber whose complaint is that he doesn't get Monday's issue before Monday. Now we know you'd be terrifically impressed to learn the RSD is going to take one of the first copies off the press and mail it to the subscriber special delivery so he'd get it on Sunday, with the added expense of $5.20 per annum being borne by aforementioned RSD—however our nose for news has a broken heart since we can't report this happy solution as an actuality. But when an avid and loyal reader wants his STEEL on time, or even before, something must be done. Incidentally, they scotched our other two solutions which included (1) dating our issues three days ahead of time and (2) sending galley proofs before the book goes to bed.

Worm avec Editor

■ Frequently Ol' Shrdlu is faced with the problem of the reason for using the plural form of the personal pronoun. R.H.L., former Chicago Trib columnist, once explained this very nicely. Editors and people with tapeworm are permitted by tradition to use the word "we" in referring to themselves, he say. So, no matter how you look at it, we're justified.

Ponderous Problem

■ That New Metal Products section on page 61 this week interests us strangely, what with such diversified objects as corn huskers, mop wringers, shot guns and ice cream coaters being announced. The ice cream coater in itself has caused us a bit of worry. We understood originally that it was a "popsicle dipper" (say that out loud rapidly *ten times*) and same time learned it was to put the chocolate coating on ice cream bars. At first the NMP ed. wrote something to the effect that the machine took popsicles in a cold, nonplastic state and quenched them in chocolate. But we always thought a popsicle was a sort of frozen fruit-juicy liquid on a stick, and never saw one with a chocolate coating. So the NMP ed. finally decided they must be legitimate ice cream bars that were dipped. Anyway, the machine is made entirely of stainless steel, which is all that really concerns us (except just what the devil IS a popsicle).

Hale Fellow, Well Melted

■ While touching on the subject of tongue twisters, we are not reminded of a news release that once came to the engine room (abode of the engineering staff). With a horrible wild glint in his eye, one of the hacks sat at the console of his mighty gaspipe typewriter and punched out the following head for the article:

Melt High-Melting Metals In High-Melting Metal Melter

Many moons have since passed, the article was run (with a different head, we might mention), and the hack is still alive and happy, never realizing how close he came to eternity on that fateful day.

—SHRDLU

John Moser, Logan, Utah, general contractor.

Pig Iron

Pig Iron Prices, Page 74

Pittsburgh — Pig iron producers are taking their cue from the somewhat better tone felt in the steel markets. Although present production schedules are remaining steady and slow, the outlook is optimistic. Small orders are constantly entering the market, with an occasional carload, and it is generally believed consumers' stocks are low. Constant flow of small business to consumers will shortly be translated directly to pig iron producers with a small gain in the rate of operations.

Cleveland — New business booked by pig iron producers has failed to show expected improvement. Current orders are generally limited to carloads with little contracting for full quarter requirements. Most sellers estimate that January will hold on a par with December, with a good chance of showing a moderate improvement in some instances. Farm implement foundries are comparatively busy, but this condition is expected to show a gradual decline over the next few months as peak activity in this industry is passed. Prices are unchanged.

Chicago—Pig iron shipments lack further improvement and January will recover only a small part of the decrease experienced during December. A number of foundries closed over the year-end again are in production again but the increase in total melt has been small. New business is slow, due to extensive carry-over of iron ordered last quarter, but the market is firm at $24, furnace, for No. 2 foundry and malleable.

Boston — Compared with recent activity, the gain in small-lot pig iron buying is encouraging, but shipments to consumers are well below normal. What improvement has developed represents a moderate upturn in melt rather than any substantial purchasing for future needs. One large user in the Providence, R. I. district has further built up stocks, although this is an exception. Stocks of foreign iron for spot sales are heavier and 2500 tons have been unloaded at Bridgeport, Conn.

New York — A slight pick-up in pig iron specifications is noted, due primarily to a larger melt at some plants rather than end of the inventory period. Principal buyers are machine tool builders, who continue active in working off old orders. Export inquiry is featured by 25,000 tons of basic for an unnamed Euro-

pean destination. A scattering of small inquiries from abroad are noted, involving various grades of iron and generally not exceeding 200 tons. One exception involves 500 to 1000 tons of standard foundry iron. Since the beginning of this month a few small export orders have been placed, including lots for Holland, and Scandinavian countries.

Washington—E. & G. Brooke Iron Co., Birdsboro, Pa., has been awarded 223 tons low phos foundry iron for delivery at the Norfolk, Va., navy yard at $26.20 a ton, the final award of 626 tons for various yards, closing Dec. 14.

Philadelphia — Navy department took bids Jan. 14 on 463 tons of pig iron for delivery to various East and West coast yards to supplement the 626 tons awarded in December. On the largest lot, 224 tons special foundry iron with maximum 0.30 phosphorus permitted, Bethlehem Steel Co., Debevoise-Anderson Co., Hanna Furnace Co., Republic Steel Co. and Alan Wood Steel Co. submitted identical bids of $30.23, delivered Norfolk, Va. This quotation was based on Swedeland, Pa., plus $3.98 freight. Some deviation in prices was evident on lots for other yards but these were said to be due to difference in method of figuring freights. In December, the Norfolk yard bought 223 tons at $26.20. This was awarded to E. & G. Brooke Iron Co., Birdsboro, Pa.

Eastern Pennsylvania demand for pig iron shows little improvement. Consumers are gearing specifications close to actual requirements and in practically all instances are asking for quick shipment, indicating low stocks. Some foreign inquiry is noted.

Buffalo — Even though pig iron producers are experiencing a slight improvement in shipments, a further contraction in operations probably will be necessary, unless really substantial buying develops.

Foundries are placing miscellaneous orders in a better volume than at the close of the year. The result is that some producers are forced to accumulate iron.

Cincinnati — Pig iron shipments are little better than in December and buying is limited to occasional carloads. Foundry schedules continue light and inventories, not excessive normally, are adequate for several weeks. The same condition applies to contracts, which may hamper a buying move for the whole quarter but which would fail to cover needs during a heavy melting period. Prices appear firm in absence of a test.

St. Louis — The melt of pig iron continues slow and gradual expansion which commenced in the first week of January. Shipments are also increasing moderately, the average daily rate so far this month being slightly above that in December, though measurably below a year ago. Revival of activities at plants is reflected in more buying of small tonnages, ranging from single carlots to 150 tons, and embracing both northern and southern iron. Sellers are not looking for the placement of real tonnages during the present quarter since the present low rate of operations will hardly exhaust supplies already on hand or under contract for the period.

Birmingham, Ala. — First quarter business continues comparatively slow. Twelve furnaces are blowing, but shipments are not keeping pace, resulting in the stacking of some iron. Few carload lots are moving.

Toronto, Ont.—Favorable improvement in the iron and steel markets is responsible for increased sales of merchant pig iron. According to local blast furnace representatives most melters that cover by quarterly contracts have placed orders to the end of March and current sales are for spot delivery. Sales for the week rose to approximately 1800

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tons, in lots of 50 to 300 tons. There has been minor improvement in the daily melt. Now close to 70 per cent. Pig iron production continues at about 65 per cent of capacity, with six of the 11 furnaces in Canada blowing. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 76

Philadelphia — No. 1 heavy melting steel continues at a flat price of $15, delivered Eastern Pennsylvania plants. It is emphasized in the trade, however, that this quotation is largely nominal and that no tonnage could be purchased at less than $15.50. In connection with this situation, it is officially denied that 15,000 tons of No. 1 steel were purchased within the past three weeks or so by a leading independent at $15.50, delivered. As evidence of underlying strength in the market, is the report that several hundred tons of No. 1 railroad steel have been purchased at approximately $16 a ton. It is believed that this material is being applied against export orders. On the surface, district steel makers display no interest in additional commitments since it is pointed out that present supplies are more than sufficient for current requirements. Brokers now are paying $14.50 for No. 1 steel against outstanding domestic orders but as high as $15.25 is said to have been paid for export. Cargo space is more freely available but most of the export movement is from South Atlantic and Gulf ports. However, several boats are scheduled to load here over the next few weeks.

Chicago — Scrap is extremely dull and prospects for an increase in mill buying are less favorable. Offerings are moderate but dealers are being compelled to dispose of some of their accumulations. Shipments against mill contracts are small. Prices are nominally unchanged but lack strength.

Pittsburgh — An unusually quiet market here gave sellers no opportunity to test prices, which are held strong by two factors. Scrap for export has been bolstering the local prices and the low state of most dealers' stocks exerts a bullish influence because of possibilities of an upswing in steel. There is no doubt here that little scrap could be accumulated at present prices should demand appear, because it would in all probability be necessary to go into other territories to collect many grades, driving prices upward. However, at present rates of demand, dealers' stocks are sufficient, indicating that the market might be considerably lower were it not for prices commanded in the export market.

Boston — Although scrap price changes are few, the trend is upward, with the market firmer despite lack of demand by domestic consumers. No. 2 machinery cast, forge flashings and skeleton have been marked up 25 to 50 cents, but for Pennsylvania delivery little additional tonnage has been brought out. Although reluctant to confirm the fact, more No. 1 heavy melting steel for export is bringing better than $14 dock. In some instances as much as $15 is reported paid for selected material.

New York — Grate bars and stove plate are 50 cents higher for shipment to Eastern Pennsylvania although domestic buying continues light with little heavy melting steel moving except for export. Shippers still pay $13.50, barge, for No. 1, although for selected lots of railroad steel around $15 is being paid for material alongside steamer at northern New Jersey points. Scrap is coming out less freely and all material offered is being bought for export. Some increase in cargo space is expediting shipments.

Buffalo — With consumers and dealers anywhere from 50 cents to $1 apart on quotations, the iron and steel scrap market remains deadlocked. A few small sales were reported among dealers and foundries but no substantial tonnages of steelmaking grades changed hands.

Detroit—Trading in scrap continues on dead center, Fisher lists last week bringing unchanged bids. The leading steelmaker here remains out of the market. Foundry grades are not moving in view of prevailing quiet among tool and die shops.

Cincinnati — Quotations on iron and steel scrap were not disturbed by recent bidding on railroad lists. Optimistic sentiment keeps prices firm despite light mill demand. Dealers, sensing an upturn soon, have steadily augmented yard supplies over the last few weeks. Several dealers, however, are near the halting point in this policy. The Louisville & Nashville railroad withdrew all but 25 per cent of a recent list calling bids unsatisfactory.

Birmingham, Ala. — What business there is in scrap is mostly in special grades with nothing at the moment to indicate a particular livening of the market. Prices are nominally unchanged.

St. Louis — While the market for iron and steel scrap continues slow, there is a decided undertone of strength and two or three specific

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price advances have been made. The short interest has been considerably reduced in recent weeks, but there is still a fairly large quantity to be covered, and dealers are finding it hard to pick up material.

Seattle — Japanese credits are slightly easier, permitting shipping of some old commitments. New business from the Orient is not being placed although it is expected Japan will be a moderate purchaser soon. Meanwhile local mills are not interested and foundries are taking only small tonnages. In the absence of representative sales, prices are nominal. Dealers are willing to buy attractive lots to hold for speculation.

Toronto, Ont.—Trading in iron and steel scrap shows little change from the preceding two or three weeks. Consumers are interested in special grades, such as heavy melting steel, stove plate, machinery cast and wrought scrap, for which there is steady demand. Other lines are moving slowly. Local dealers are carrying large quantities of automobile scrap with little resale demand.

Warehouse

Warehouse Prices, Page 75

Cleveland — Some improvement is noted in sales and shipments from warehouse stocks. This is due in part to some customers being unable to get reasonable delivery from mills operating on uncertain rolling schedules. However, most present requirements originate from many miscellaneous customers buying for actual needs. Prices are firm and unchanged.

Chicago — Sales this month are ahead of the comparable December period but gains have been small and business continues below the level of a year ago when consumers were ordering heavily in anticipation of price advances and labor troubles. Orders are well diversified but small.

New York—While small orders being taken by warehouses are slightly more numerous, the total tonnage being moved by jobbers continues light. Material entering into building is notably dull.

Philadelphia—Slight improvement in both sentiment and orders has developed. However, consumers continue to buy on a hand-to-mouth basis and large orders are few. Jobbers report the price situation unimproved. The larger interests are maintaining published levels.

Cincinnati — Sales by jobbers continue to show a conservative attitude, all being restricted to immediate needs. Tonnage is likely to be little heavier this month than in December. So far inquiries for building materials have been few and for slight steel requirements.

St. Louis — Conforming to the seasonal trend, there has been a moderate expansion in distribution of iron and steel from store during the past ten days or two weeks. The betterment is accounted for principally by miscellaneous consumers, the large purchasing groups having failed to enter the market. Universally buying is on a strictly necessity basis, and warehousemen believe this attitude will prevail until there is a distinct change in prospects for general business.

Steel in Europe

Foreign Steel Prices, Page 75

London—(*By Cable*)—European steel cartel has reduced prices by the amounts added in May, 1937. This action is said to have been taken to meet competition by steelmakers in the United States.

Steel markets in Great Britain are quiet but production continues at a high rate. Producers of heavy steel have business on books sufficient to keep them busy for several months.

Foreign trade continues at a high rate. Imports in December were 288,343 tons, a gain of 15,842 tons over November. Exports were 196,807 tons, 1201 tons less than in November.

The Continent reports export trade continues dull but improvement is expected when uncertainties of price have been removed.

No decision has thus far been reached in the course of discussions among domestic steel exporting companies as to their participation in the European steel cartel or adherence to price levels, which would be legal under the Webb-Pomerene act. The negotiations are being continued, it is understood, and hope for an agreement is held by some exporters. The above action by the cartel would indicate steelmakers in Europe do not expect adherence by American producers.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

From a low of around 24 per cent in December bolt and nut production has now increased to around 28 to 30 per cent. Most buyers appear to have fair stocks at hand with a result that further increases are ex-

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pected to continue moderate for the time being. Much ship work is in sight, but as usual rivet requirements do not begin to come out until after the keel work is done, it will probably be some time before ships now active will mean much in point of actual rivet specifications. Mill prices are steady although some easiness is noted in the resale market, where some jobbers are apparently offering concessions in an effort to liquidate excess stocks.

Tin Plate

Tin Plate Prices, Page 72

New York—In contrast with the specifications a year ago, tin plate specifications are coming out slowly, a fact attributed in part to a fairly substantial carry-over at the close of last year. Moreover, export demand is not showing the life of a year ago and this is accounted for in part by the somewhat easier situation now prevailing in certain other tin plate producing countries, England notably. Approaching fish canning season here is expected to result in some increase shortly, however. This season should be getting under way around the latter part of February, it is said.

Ferroalloys

Ferroalloy Prices, Page 74

New York — Ferromanganese shipments have shown further moderate improvement over the past week, reflecting slight gain in steelmaking operations. However, the movement for the month, while showing some increase over December, will not be up to early expectations, according to some trade leaders. Prices are steady at $102.50, duty paid, Atlantic and Gulf ports.

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York — Sentiment in major nonferrous metal markets weakened last week with the price trend reversing itself. Copper and allied product prices declined from ¼ to 1.37½c while tin dropped about 1 full cent. Despite lower levels consumers showed little buying interest.

Copper — Primary mine producers lowered electrolytic copper ½-cent to 10.50c, Connecticut, while custom smelters cut prices ⅜-cent on Wednesday and ¼-cent further on Thursday to 10.25c. All copper and brass products, including scrap allowances, eased ½-cent brass ingots ½-cent, and casting copper ⅝-cent. Bare and magnet wire declined ½-cent while weatherproof wire eased ⅜-cent on Thursday and 1 full cent additional on Friday. Export copper dropped steadily to close around 10.15c. A further decline in the primary copper market would not be surprising.

Lead — Demand was quiet although a moderate volume of business was done on a few days. The undertone of the market was weak due to a steady decline in prices on the London Metal Exchange. Prices held here at 4.90c, New York, and 4.75c, East St. Louis.

Zinc — Generally only routine business was transacted at 5.00c, East St. Louis, for prime western.

Tin — Straits spot dropped from 42.50c at the close of the previous week to 41.25c, the lowest level recorded since Jan. 3. Consumers showed more buying interest at the lower levels.

Antimony — The domestic market was dull with American and Chinese spot holding unchanged respectively at 13.75c and 15.62½c, New York.

Equipment

Chicago — Small tool demand continues dull, and while activity in larger equipment makes an unfavorable comparison with a year ago, business is regarded as fairly satisfactory considering the depressed rate of general industrial operations. Inquiries are holding up reasonably well despite the absence of large lists. January sales in some instances are expected to be smaller than December, but last month's business was the best of the fourth quarter for a number of sellers and for some interests was the best of the second half. The low rate of plant operations is expected to hold small tool buying sharply below the volume a year ago for the near future.

New York—While a fair volume of machinery and industrial equipment is being offered for estimates, buying for domestic needs is sluggish and confined to a scattered number of one or two tools. Requests for estimates are made largely for the formulation of possible buying programs, although a minimum of business is expected to be placed unless a decided change in the general outlook is evident. The drop in domestic buying has hit dealers harder than manufacturers who in several instances have booked substantial export orders direct. Some domestic orders are on dealers' books for delivery in May, but February and March shipment apply to most business now on dealers' books.

Boston—Large orders for export, notably machinery requirements for a complete Russian automobile plant, have been placed with New England machine builders. As a result, backlogs are large with several shops despite a drop in domestic buying. Backlogs for domestic needs are smaller. A good part of this foreign volume has been placed direct with producers. Japan has also placed substantial business in New England. Several government lists have also been placed with shops in this district and inquiry includes eight turret lathes for the Newport, R. I. torpedo station.

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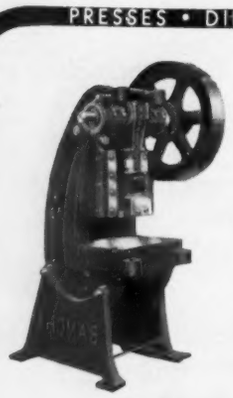

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Construction and Enterprise

Michigan

BIRMINGHAM, MICH.—Birmingham city commission is discussing plans for constructing sewage disposal plant. Site has been purchased.

DETROIT—Pfeiffer Brewing Co., Detroit, contemplates additions and alterations to its plant. Cost about $500,000.

DETROIT—Bohn Aluminum & Brass Corp. will erect foundry building in Adrian, Mich., including boiler house. Buckheit & Stuchell, Detroit, architects.

DETROIT—L. G. Lenhardt, commissioner of public works, takes bids to Jan. 27 for furnishing and installing one three-motor 15-ton crane, span, 52 feet 8½ inches, lift, 40 feet, control cab in sludge filter building; one five-ton one-motor floor controlled crane, span, 32 feet 3 inches, lift, 27 feet, in machine shop at West Jefferson avenue and Rouge river sewage plant. G. R. Thompson, city engineer.

GRAND RAPIDS, MICH.—Consoer, Townsend & Quinlan, 205 West Wacker drive, Chicago, engineers, have submitted report to city commission on sewage treatment plant improvements to include activated sludge plant and additions to existing plant. Cost $1,650,000. C. Sophus Johnson, city manager.

KALAMAZOO, MICH.—Plans have been completed for constructing addition to municipal electric lighting and power house. Estimated cost $270,000. Burns & McDonnell, Kansas City, Mo., engineers.

LANSING, MICH.—State procurement office is taking bids on all materials for constructing sanitary sewers and force pumping station to be installed for city of Muskegon, Mich. Cost including equipment $105,000.

MENOMINEE, MICH.—City plans sewage disposal plant. Cost $312,000. Robert Cramer & Sons, 647 West Virginia street, Milwaukee, engineers.

MENOMINEE, MICH.—City will proceed with constructing $888,000 municipal light and power project with PWA funds allotted in 1934, litigation against work having been dismissed in local courts. Plans prepared by Francis Engineering Co., Saginaw.

SANDUSKY, MICH.—Bids for constructing city sewage treatment plant are to be readvertised. Bruce Buchanan, Pontiac, Mich., engineer.

New York

BUFFALO—Buffalo Niagara Electric Corp., Horace L. Mann, president, plans completion of construction program in Buffalo area this year. Includes installing 1,125,000 feet of underground cable and constructing new terminal station to cost $1,500,000. Cost of entire program $5,000,000.

BUFFALO—G. Summers, commissioner of public works, takes bids to Feb. 3 for furnishing, erecting and installing four 60-cycle electrically-driven centrifugal pumps, including switchgear and appurtenances, two pumps to have 50 million gallons per day capacity and two to have 25 million gallons per day capacity each. To be installed in Ward pumping station. Alternate is for furnishing, erecting and installing four 25-cycle electrically-driven pumps including switchgear and appurtenances, two pumps to have capacity of 50 million gallons per day and two with 25 million gallons per day capacity; also furnish labor and materials for foundation for four electrically-driven centrifugal pumps.

LAKEWOOD, N. Y.—Town plans sewage disposal plant. Applied for WPA grant. Cost $60,000. Hill & Hill, 24 East Main street, North East, Pa., engineers.

SCHENECTADY, N. Y.—Board of supervisors, Schenectady county, plans purchasing new refrigeration and plumbing equipment for county jail. Cost over $25,000.

SOLVAY, N. Y.—Board of supervisors, Onondaga county, court house, Syracuse, is making survey for constructing sewage treatment plant and sewer lines to serve village and New York state fair grounds. State to pay part of construction cost. Cost $500,000. G. D. Holmes, c/o owners, engineer.

TONAWANDA, N. Y.—City plans constructing sewage disposal plant. Maturity soon. Cost $50,000.

Massachusetts

EVERETT, MASS.—Boston Elevated Railroad Co., 31 St. James avenue, Boston, plans machine shop. Cost $40,000. Private plans.

LAWRENCE, MASS.—McCabe Boiler Works, 9 Water street, was damaged by fire. Moulds and patterns damaged.

Pennsylvania

PITTSBURGH—Pressed Steel Car Co. pipe shop, Stowe township, was damaged by fire.

Ohio

CIRCLEVILLE, O.—City has plans completed for sewage disposal plant and flood protection wall. Includes auxiliary pumping equipment, metering equipment and digestion tanks. Board of health will advertise for bids soon.

LORAIN, O.—Lorain Telephone Co., H. E. Hageman, manager, plans purchasing 400 new hand-set telephones, poles, wire, conduit and cable for modernizing and improvement program. Cost $200,000. Maturity soon.

MIDDLETOWN, O.—Crystal Tissue Co., Z. W. Ranck, president, takes bids for furnishing and installing new 2000-kilowatt turbine condenser with alternating current electric motor.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a.m., Feb. 7, for one heat treating, pit type electric furnace, in accordance with air corps specification 50253 A, dated Jan. 3, 1938; one electric heat treating furnace 1850 degrees fahrenheit in accordance with specification 50119 A dated Jan. 3, 1938; delivery f.o.b. contractor's plant.

Illinois

CHICAGO—Chicago Electric Co., 1318-34 West Cermak road, would like to purchase double drum used hoist equipped with 100-horsepower three-phase 60-cycle 2200-voit motor, suitable to operate 2½-yard drag line bucket, with or without motor.

CHICAGO—Midwest Steel Co., 839 West Cermak road, has been incorporated here with 100 shares no par value stock, to deal in iron and steel. Sol Friedman, A. Block, incorporators. Jacob E. Yaffe, 11 South LaSalle street, correspondent.

ROODHOUSE, ILL.—City takes bids in March for sewerage system and sewage disposal plant with auxiliary piping and appurtenances. Cost $140,000. Caldwell Engineering Co., Jacksonville, engineer.

SOUTH ELGIN, ILL.—City plans mains, pumping equipment, standpipe. Cost $40,000; $20,000 bonds voted.

Indiana

FT. WAYNE, IND.—PWA has refused grant on contemplated $6,000,000 sewage disposal plant by city. Cole, Moore & Geupel, LaSalle street, South Bend, Ind.,

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engineers, are making surveys to determine how much can be done with $3,000,000 available from recently passed bond issue.

MUNCIE, IND.—Indiana Steel & Wire Co. plans two concrete factory buildings. Cost with equipment $40,000.

Alabama

GREENVILLE, ALA.—Butler County Membership Corp. has been organized here with Dr. C. Wall, president, Forest Home; W. H. Harrison, Greenville, secretary. Has $180,000 in federal funds to construct transmission line.

Maryland

BALTIMORE—Consolidated Gas, Electric Light & Power Co.'s program for 1938 includes expenditures of $5,422,133.

District of Columbia

WASHINGTON—Yards and docks, navy department, accepts bids to Feb. 16 for motor-driven pumps, piping, plumbing and air conditioning apparatus for drydock at Mare Island, Calif., navy yard.

WASHINGTON — General purchasing officer, Panama canal, takes bids to 10:30 a.m., Jan. 28, schedule 3326, for steel rivets, steel washers, and flanged cast-iron pipe fittings in various amounts; until 10:30 a.m., Jan. 31, schedule 3322, for various amounts of electric motors, watthour meters, transformers, power cable, telephone cable, insulated wire, steel conduit and fittings, nickel-steel bars, structural steel bars, structural steel shapes, cast-iron separators, cast-steel separators; until 10:30 a.m., Feb. 2, schedule 3325, for various amounts of spiral-riveted pipe, boiler feed pumps, electric grinding machine, welding rods, portable forges, metal-cutting band saws, chain shackles, steel bolts, steel wire cloth, corrugated metal roofing, and cast-iron water pipe and fittings; delivery of all items at Cristobal or Balboa, Canal zone, Isthmus of Panama.

WASHINGTON—Bureau of supplies and accounts, navy department, takes bids to 10 a.m., Jan. 28, schedule 2595, for seamless steel elbows, delivery various east and west coast points; schedule 2578, for steam windlasses and spare parts, delivery various east and west coast points; schedule 2579, for combination woodworking machine, delivery Mare Island, Calif.; schedule 2597, for high speed steel cutters and saws, delivery Philadelphia; until 10 a.m., Feb. 1, schedule 2479, for vertical, motor-driven hydraulic broaching press, delivery Alexandria, Va.; schedule 2580, for universal motor-driven milling machine, delivery San Pedro, Calif.; schedule 2581, for heavy-duty motor-driven engine lathe, delivery San Pedro, Calif.; schedule 2582, for motor-driven engine lathe, delivery San Pedro, Calif.; schedule 2604, for insulated electric cable, delivery various east or west coast points; schedule 2622, for steel expansion joints, delivery various east and west coast points; until 10 a.m., Feb. 4, schedule 2641, for corrosion-resisting steel tubing, delivery Portsmouth, N. H.

Florida

NEPTUNE BEACH, JACKSONVILLE, FLA.—City council instructed J. Burke, Neptune city engineer, to prepare estimate on water pumping system and aerator, sewer system and additional water mains. May vote on bonds. Cost $70,000.

Georgia

BRUNSWICK, GA.—Hercules Powder Co., Delaware Trust building, Wilmington, Del., soon receives bids for steam power house and equipment. Cost $65,000.

MARIETTA, GA.—Cobb county rural electrification administration, L. R. Langley, plans constructing 200 miles of rural electric lines in Cobb county. Will apply for $200,000 loan. Carl E. Hamby, president.

Mississippi

GULFPORT, MISS.—Southern State Refining Co., Gulfport, plans improvements at its refinery. Estimated cost $75,000.

MERIDIAN, MISS.—Southeastern Box Co. Inc., capital $50,000, George Morrison, president, will establish manufacturing plant in building formerly occupied by Winner, Klein store. Has tentative plans for erection of building.

PORT GIBSON, MISS.—Fire damaged veneer and planing mills and dry kilns of Southern Package Corp.

STARKVILLE, MISS.—City, Augustin Magruder, mayor, has PWA loan of $68,000 and grant of $53,055 for constructing light plant. A. S. Brumby, Starkville, engineer.

North Carolina

CHARLOTTE, N. C.—Finer Full Fashioned Hosiery Co., Pineville road, outside city limits, plans doubling capacity of plant, including installing additional equipment.

GOLDSBORO, N. C.—City, Z. G. Holloweil, city manager, receives bids in about three weeks for waterworks improvements including 1200 feet 16-inch cast-iron pipe, 1,000,000-gallon elevated water tank, 1500-gallon-per-minute pump. W. C. Olsen, 5 Exchange place, Raleigh, engineer.

GREENSBORO, N. C.—Greensboro Pepsi-Cola Bottling Co. acquired building at 106 Pearson street and will equip as bottling plant.

PLYMOUTH, N. C.—North Carolina Pulp Mill, L. J. Meumier, vice president, Plymouth, plans constructing finishing mill. Estimated cost $300,000.

PLYMOUTH, N. C.—Union Bag & Lumber Co. plans pulp and paper mill with 150-ton capacity. Cost $40,000.

WILMINGTON, N. C.—City wishes to purchase diesel engine to generate electric power for municipal waterworks. J. E. L. Wade is commissioner of public works.

South Carolina

SUMMERVILLE, S. C. — Town has under construction new water supply system including installing 26,000 feet 8-inch concrete-lined cast-iron pipe; will install pumps and use own filter plant. Bids now being taken for pumps. Cost of project $35,000.

Tennessee

CHATTANOOGA, TENN. — Welding Gas Products Co. has been incorporated here with $200,000 capital by M. E. White, 200 East Minnesota avenue, Knoxville, and J. D. Williams, Chattanooga. Plant to be erected for producing industrial gases. Cost $100,000.

CHATTANOOGA, TENN.—Chattanooga electric board accepted report of chief engineer S. R. G. Finley for first of two projects in city's power distribution system, including 4000-volt transmission line linking Chickamauga dam switchboard with four substations, estimated cost $110,000; second contract is for substation transformers for 44,000-volt substations, calls for three 1667-kilovolt-ampere transformers and four 3333-kilovolt-ampere transformers, and four 5000-kilovolt-ampere transformers to step down from 44,000-kilovolt-amperes to a distribution voltage. Estimated cost $105,000. Construction to begin probably in March. (Noted in STEEL, Dec. 27, 1937).

KNOXVILLE, TENN.—City, W. W. Mynatt, mayor, receives bids Jan. 31 for furnishing labor and materials for complete electric distribution system for city in a portion of the city described as district No. 2. Burns & McDonnell Engineering Co., 107 West Linwood, Kansas City, Mo., engineer.

KNOXVILLE, TENN.—City council voted to issue $1,460,000 bonds to help construct municipal power system using TVA power. Mayor Walter W. Mynatt will apply to PWA for immediate release of remaining $2,300,000 of a $2,600,000 loan grant approved in 1934; will readvertise for bids on constructing North Knoxville unit of proposed system, since only one bid was submitted last November on project and was returned unopened.

LENOIR CITY, TENN.—City votes Feb. 2 on bonds for constructing electric system for distributing TVA power. PWA loan-grant of $55,000 has been applied for. (Noted in STEEL for Dec. 27, 1937).

Louisiana

HAMMOND, LA.—City considering constructing light and power plant. James M. Fourmy, city engineer.

MANSURA, LA.—Apte Bros. Canning Co. is considering establishing canning plant. Cost $30,000. A. L. Henderson, Mansura, representative.

SHREVEPORT, LA.—South Arkansas Refining Co., Shreveport, plans to construct 3500-barrel refining plant near Ravana, Ark.

West Virginia

ELKINS, W. VA.—Kenwood Corp., Elkins, (now being formed as interest of Tygart Valley association, same place) care of E. T. Hutchings, Heyburn building, Louisville, Ky., architect, plans installing motors and controls, conveyors, electric hoists and other equipment in new hardwood mill at Elkins. Includes powerhouse to be built. Cost $400,000. Will ask for bids early in 1938. Architect in charge.

Virginia

BOWLING GREEN, VA.—REA alloted $12,000 additional for power lines in Caroline, Hanover, King and Queen, Louisa, Orange and Spotsylvania counties by Farmers Rural Utilities Inc.

CHARLOTTESVILLE, VA.—Piedmont Engineering Co., Box 574, would like to purchase 150-horsepower corliss engine, 9 x 9 used ammonia compressor, and 2000-gallon-per-minute steam turbo-centrifugal pump.

Missouri

LA PLATA, MO.—City will soon start work on light plant. Cost $100,000. PWA alloted loan of $71,200 and grant of $28,000.

Arkansas

LITTLE ROCK, ARK.—Southwestern

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Bell Telephone Co., E. N. McCall, district manager, plans building $500,000 addition to plant at Seventh and Louisiana streets. Construction to begin April 1, completion scheduled for Oct. 1. Includes installing equipment to serve dial telephones; 5000 manual type telephones will be converted to dial system in Little Rock.

Wisconsin

BEAVER DAM, WIS.—Dodge county board has appropriated $15,000 for enlarging highway headquarters and purchasing additional equipment. L. A. Kohn, county highway commissioner.

MILWAUKEE—Stokerunit Corp., 4548 West Mitchell street, machinery manufacturer, has increased its authorized capitalization from $10,000 to $75,000 to accommodate growth in operations. Lawrence J. Radermacher, president.

Minnesota

BRAINERD, MINN. — City, Mabel Sheflo, city clerk, is completing plans and has made application to WPA for funds to construct sewage disposal plant. Cost $350,000. Burlingame, Hitchcock & Estabrook, 521 Sexton building, Minneapolis, consulting engineers.

COSMOS, MINN.—Bond issue of $12,000 was approved at Dec. 28 election to aid in financing construction of steel tower and tank, cast-iron water mains and pumping station. Cost $27,000. H. Zurst, village clerk. Ealy G. Briggs, 1957 University avenue, St. Paul, consulting engineer. (Noted in STEEL for Jan. 17).

FARMINGTON, MINN.—REA has alloted $20,000 additional funds to Dakota County Electric Co-operative, C. H. Gelder, manager, Farmington, to construct 15 miles new transmission lines to serve customers in Goodhue and Dakota counties. Banister Engineering Co., 1856 University avenue, St. Paul, is consulting engineer.

HOWARD LAKE, MINN.—City, R. C. Temple, city clerk, is completing plans for constructing sewage collection and disposal system. Cost $50,000. Burlingame, Hitchcock & Estabrook, 521 Sexton building, Minneapolis, consulting engineers.

MANKATO, MINN. — City council passed resolution authorizing issuance of $75,000 bonds to finance constructing filtration plant. J. W. Bates, city clerk.

Texas

ABILENE, TEX.—City, care of W. W. Hair, mayor, revised plans for waterworks improvements including pumping plant and filtration plant units. Cost $300,000. Maturity in spring. R. C. Hoppe, resident engineer. Hawley, Freese & Nichols, Capps building, Ft. Worth, engineers.

HOUSTON, TEX.—Adolphus Rice Milling Co., organized by Adolph A. Pfeffer, 2920 Ela Lee lane, will construct rice mill on two-acre site. Includes power house and diesel engine to operate mill. Total cost of project $100,000.

HOUSTON, TEX.—City, R. H. Fonville, mayor, recommended expenditure of $246,000 for emergency repairs and improvements to water department, including drilling three wells, constructing 200,000-gallon storage tank, repairs to six existing wells and new equipment and mains. Alvord, Burdick & Howson, 20 North Wacker drive, Chicago, Ill., consulting engineers, are making survey for major expansion program to cost estimated $4,000,000.

South Dakota

MURDO, S. DAK.—Bond issue of $7500 approved by voters at recent election to finance constructing filtration plant. H. P. Judd, city auditor.

Iowa

MAQUOKETA, IOWA—City, care of city clerk, will purchase equipment soon for municipal light plant. Cost $70,000. (Noted in STEEL for Dec. 20, 1937).

MASON CITY, IOWA—Peoples Gas & Electric Co., Mason City, contemplates constructing electric service lines and 60 miles rural transmission lines.

MASON CITY, IOWA—City, Rena B. Mack, city clerk, contemplates constructing elevated water tank, well, and turbine for well. Cost $100,000. C. H. Stevens, city engineer.

OTTUMWA, IOWA—Horace A. Brown, superintendent of waterworks, has recommended to city council construction of a pumping station. Plans not definite. Thomas P. Sullivan, city clerk.

Nebraska

FAIRBURY, NEBR. — City, Elsie Schnuelle, city clerk, has employed Robert Fulton, 2327 South Nineteenth street, Lincoln, as consulting engineer to advise regarding feasibility of purchasing new equipment for municipal light plant. Cost of plant $150,000.

HASTINGS, NEBR.—Central Nebraska Power & Irrigation District, R. O. Canady, secretary, takes bids to 11 a.m., Jan. 27, for constructing 60-mile 69-kilovolt transmission line from North Platte to Keystone dam and equipment, including transformers, conductors, anchor assemblies, switchgear, and necessary auxiliaries. Specifications obtainable from secretary. George E. Johnson, Hastings, chief engineer and general manager.

LINCOLN, NEBR.—City, Theodore H. Berg, city clerk, has made application to WPA for aid in erecting improvements at city's A street water plant to obtain more uniform chlorination. Cost $48,000. D. L. Erickson, city engineer.

LINCOLN, NEBR.—City, Theodore H. Berg, city clerk, has signed contract with Black & Veatch, 4706 Broadway, Kansas City, Mo. consulting engineers, to inspect municipal power plant preliminary to improvements, including installing new boilers, new switchboard and other equipment. Cost $175,000. D. L. Erickson, city engineer.

ST. PAUL, NEBR.—REA has approved $25,000 allotment to Howard County Rural Public Power District to finance house wiring. James Fisher Jr., Elba, secretary. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

STROMSBURG, NEBR.—REA has approved $5000 allotment to Polk County Rural Public Power District to finance house wiring. Agvall S. Torrell, Stromsburg, secretary. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

Colorado

BASALT, COLO.—Frying Pan Light & Power Co. plans generating plant on Frying Pan river near Basalt for light and power service to municipality, which has granted 20-year franchise. Cost with electrical distribution lines close to $100,000. Prouty Bros. Engineering Co., Exchange building, Denver, consulting engineer.

DENVER—Bureau of reclamation, department of the interior, Denver, takes bids for furnishing one vertical-shaft 15,000-horsepower 225-revolution-per-minute hydraulic turbine, one governor with pumping equipment, one 12,000-kilovolt-ampere 90 per cent power factor, one vertical-shaft alternating current generator, for installation at Seminoe power plant, Kendric project, Wyoming. J. C. Page, commissioner.

Idaho

ST. ANTHONY, IDAHO—Mayor A. G. Miller has applied for use of water from Snake river for proposed municipal hydroelectric system, including dam and power plant. Cost $165,000.

Pacific Coast

COALINGA, CALIF.—Coalinga high school district plans central heating plant in multi-story junior high school. Bond issue $230,000 approved. W. D. Coates, Rowell building, Fresno, architect.

GLENDALE, CALIF.—Southern California Telephone Co. will build new exchange at 124 South Orange street, Glendale. Cost of land and buildings $206,000. Cost of converting half the telephones in the exchange to dial service $1,200,000.

LOS ANGELES—Micro-Metals Inc. has been incorporated in Los Angeles county. R. C. Stevens, Huntington Park, H. O. Tracy and L. S. Esselstyn, Los Angeles, incorporators.

LOS ANGELES—A certificate to conduct business under the firm name Research Metal Products at 1046 South Olive street, Los Angeles, was issued to the owner, Rose Smulson, 6100 Broadway, Los Angeles.

LOS ANGELES—A certificate to conduct business under the name California Metals Co., at 8018 South Main street, Los Angeles, has been issued to the owners, R. J. Kennedy and F. S. Waterman, both of Los Angeles.

PORTLAND, OREG.—Commission of public docks plans 100-ton steel shear leg at municipal terminal No. 1. Cost $25,000. A. D. Merrill, chief engineer, is preparing plans.

STAYTON, OREG.—Plans for water system improvement, including pipe and hydrants, have been completed and application made for WPA funds.

THE DALLES, OREG.—C. T. Smith & Sons, ferry operators, propose constructing ship repair yard. Cost $14,000.

PUGET SOUND NAVY YARD, WASH. —Purchasing officer will open bids Feb. 2 for furnishing ten tons low phosphorus foundry pig iron.

SEATTLE—Pacific Telephone & Telegraph Co. announces plans for new exchange building with modern equipment at Eighth avenue south and 152nd street. Sound Construction & Engineering Co., Seattle, has general contract.

SPOKANE—Spokane Breweries Inc. announces plans for further plant expansion including wash house, racking room and equipment and machinery. Cost $100,000. Rene Besse, treasurer.

Canada

TORONTO, ONT.—Ontario hydroelectric power commission, 14 Carlton street, Toronto, plans high tension power transmission lines from Beauharnois, on the St. Lawrence river, to Leaside, and from Leaside to commission's Strachon avenue plant in Toronto, including installing additional transformers. B. O. Salter, Toronto, purchasing agent.